

# VEHICLE RECOGNITION (THREAT ARMOR)

Subcourse Number IN0534

EDITION D

UNITED STATES ARMY INFANTRY SCHOOL

FORT BENNING, GEORGIA 31905-5593

5 Credit Hours

Edition Date: November 1995

## SUBCOURSE OVERVIEW

This subcourse is designed to teach you to identify threat heavy and light armored vehicles, and their capabilities.

There are no prerequisites for this subcourse. The school recognizes that the unification of Germany has occurred. We have depicted references to enter eastern Germany as (East) Germany. Also, the term Warsaw Pact is continued in the subcourse which may be no longer valid.

This subcourse reflects the doctrine that was current at the time it was prepared. In your work situation, always refer to the latest publications.

The words "he," "him," "his," and "men," when used in this publication, represent both the masculine and feminine genders unless otherwise stated.

## TERMINAL LEARNING OBJECTIVE

ACTIONS:	Recognize and Identify threat heavy and light armored vehicles and their capabilities.
CONDITIONS:	You will have information from FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.
STANDARDS:	You will identify threat heavy and light armored vehicles and their capabilities in accordance with FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.

## TABLE OF CONTENTS

### [Subcourse Overview](#)

### [Lesson 1: Threat Heavy Armored Vehicles Identification and Capabilities](#)

#### [1. Main Battle Tanks \(MBTs\)](#)

#### [2. Light Tank \(LT\)](#)

#### [3. Light Amphibious Tank \(LAT\)](#)

#### [Practice Exercise](#)

## Lesson Two: Threat Light Armored Vehicles Identification and Capabilities

1. Armored Command Reconnaissance Vehicle (ACRV)
2. Airborne Combat Vehicle (ACV)
3. Armored Personnel Carriers (APCs)
4. Amphibious Reconnaissance Vehicles (ARVs)
5. Amphibious Scout Cars (ASCs)
6. Infantry Combat Vehicles (ICVs)
7. Infantry Fighting Vehicles (IFVs)
8. Light Amphibious Tank (LAT)
9. Mountaineers Combat Vehicle (MCV)
10. Mechanized Infantry Combat Vehicle (MICV)
11. Multipurpose Tracked Vehicle (MTV)
12. Tank Destroyers (TDs)
13. Tracked Artillery Radar and Reconnaissance Vehicles

### Practice Exercise

## Lesson 1

### THREAT HEAVY ARMORED VEHICLES IDENTIFICATION and CAPABILITIES

#### OVERVIEW

##### LESSON DESCRIPTION:

In this lesson, you will learn to identify various threat heavy armored vehicles and their capabilities.

##### TERMINAL LEARNING OBJECTIVE:

ACTION:	Identify threat heavy armored vehicles, and their capabilities.
CONDITIONS:	You will be given information from FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.
STANDARDS:	Recognize and identify threat heavy armored vehicles and their capabilities in accordance with FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.
REFERENCES:	The material contained in this lesson was derived from the following publications:  FM 100-2-3 Jane's Armour and Artillery 1989-1990 Soviet and Warsaw Pact Equipment Handbook, Revision 1.

#### INTRODUCTION

The various threat heavy armored vehicles have distinctive characteristics, and capabilities. This lesson will discuss the identification characteristics, and capabilities of threat heavy armored vehicles.

#### THREAT HEAVY ARMORED VEHICLES AND THEIR CAPABILITIES

Threat heavy armored vehicles are categorized as main battle tanks (MBTs), light tanks (LTs), and light amphibious tanks (LATs).

##### 1. Main Battle Tanks (MBTs).

Heavy armored main battle tanks (MBTs) have individual characteristics and capability differences. A variety of MBTs are dealt with in this subcourse.

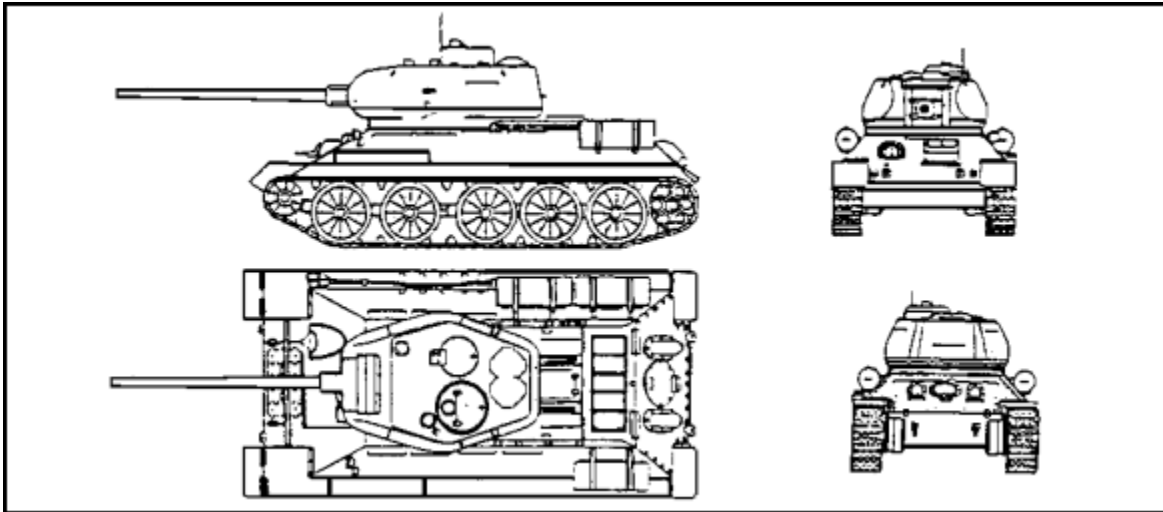


Figure 1-1. Czechoslovakian T-34/85 Medium MBT.

a. T-34/85 Medium Main Battle Tank (Figure 1-1). The Soviet built T-34/85 is primarily used for training and no longer is in front-line service with any of the Warsaw Pact countries. However, large quantities are being held in reserve.

(1) Variants. A number of T-34/85 variations have been observed and are discussed in the following subparagraphs:

(a) Anti-Aircraft Tank (China). This version is fitted with twin 37-mm automatic anti-aircraft guns, but is no longer known to be in service.

(b) 122-mm Self-propelled Gun (Syria). The mounts and guns of D-30 towed howitzers replaced the turrets on these versions. It too, is no longer known to be in service.

(c) 100-mm Field Gun M1944 (BS-3) (Egypt). This gun sits in a modified turret.

(d) 12.7-mm DShKM anti-aircraft machine gun. Some countries such as China, Egypt and Syria have fitted this gun on the turret roof.

(e) Armored Recovery Vehicles (ARVs). A variety of T-34s were modified to ARVs for towing, lifting, pushing, and pulling operations. Most modifications can be identified by the stowage platforms, winches, small and large cranes, pushbars, cable-drums, and spades mounted appropriately at strategic locations on the hull. Some of these modifications required the removal of the turret.

(f) Bridging Tanks. The Soviet version of the T-34 bridgelayer (BL) has been replaced by the T-54 (BL). A scissor type version, built by the Czechoslovaks, spans obstacles up to 15 meters wide. However, it is no longer known to be in service.

(g) Bulldozer Tanks. These tanks, developed for engineering and mine-clearing, are no longer known to be in service.

(h) Mine-clearing Tanks. The roller fitted T-34 mine-clearers were replaced by T-54 equipped mine-clearing tanks.

(i) Flamethrower Tanks. The T-34 flamethrowers were replaced by the newer T-54 equipped flamethrower tanks.

(2) Recognition Features. The T-34/85 has

- five large individually suspended dual rubber-tired road wheels on each side with the drive sprocket at the rear and idler at the front. There are no track return rollers.
- a large three-man turret forward on the hull.
- optional drum-type fuel tanks that can be fitted on the sides and rear of the vehicle for an increased operational range. The drums mount before the main fuel tanks.
- a snorkel for deep fording on some models.
- two dome-shaped ventilators mounted in the roof of the turret toward the rear.
- three types of commander's cupolas: a circular fixed cupola with twin hatch covers that open front and rear, a single hatch cupola that can be traversed 360 degrees, and a similar single hatch cupola.

(3) Vehicle Characteristics. The T-34/85 has a four-man crew consisting of the tank commander, driver, gunner and loader. It also has an all-welded hull divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. Specifications that apply to the T-34/85 are provided in the lists and paragraphs that follow.

#### T-34/85 Measurements

Combat weight, 32,000 kg.

Hull length, 6.19 meters.

Hull width, 2.997 meters.

Overall height, 2.743 meters.

Ground clearance, 0.38 meters.

Track width, 500 mm.

Fuel capacity, 590 liters.

Maximum road range, 300 km.

Cross country range, 209 km.

Maximum speed, 55 km/h.

#### Armor

##### Hull Armor Thickness

Front, 45/47 mm.

Sides, 45/47 mm.

Top, 18/22 mm.

Floor, 18/22 mm.

Rear, 47 mm.

##### Turret Armor Thickness

Mantlet, 90 mm.

Sides, 75 mm.

Rear, 60 mm.

Roof, 18/22 mm.

- (4) Vehicle Capabilities. The T-34/85 can

- cross a 2.5-meter trench.
- mount a 0.73-meter vertical step.
- climb a 60-percent grade.
- ford 1.32 meters without a snorkel.
- ford 5.5 meters with a snorkel

(5) Armament Characteristics. The T-34/85 has two layers of armament: main and secondary.

(a) Main Armament. The main gun is a 85-mm 54.6 caliber with a barrel length of 4.641 meters. It can fire three to four rds/min with an ammunition load of 56 rounds.

(b) Secondary Armament. Secondary armament consists of a 7.62-mm DTM machine gun mounted coaxially to the right of the main armament and a similar fixed weapon mounted in the bow, also on the right side.

(6) Countries Served. T-34 and T-38 tanks are in service with the following countries:

Afghanistan	Cyprus	Korea, North	Somalia
Albania	Czechoslovakia	Laos	Syria
Angola	Ethiopia	Mali	USSR
Bulgaria	Germany, (East)	Mongolia	Vietnam
China	Guinea	Mozambique	Yemen, North
Congo	Guinea, Bissau	Poland	Yemen, South
Cuba	Hungary	Romania	

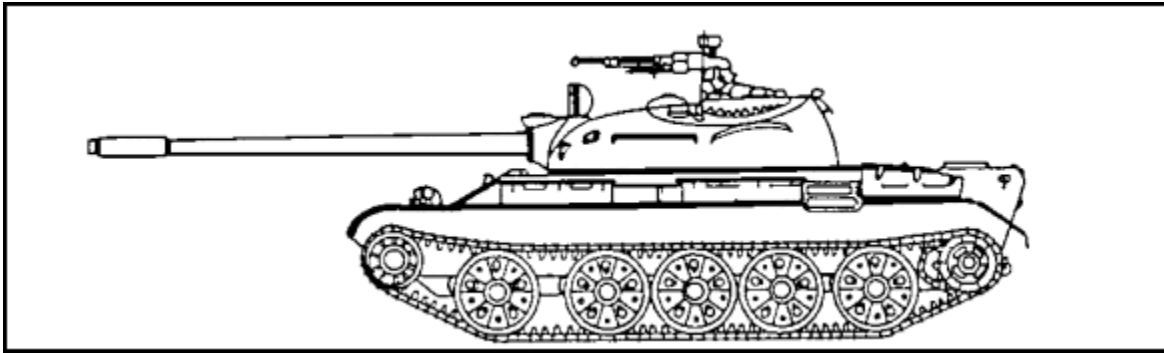


Figure 1-2. Soviet T-54B with 12.7-mm DShKM Anti-aircraft Gun.

b. T-54/55 Main Battle Tank (Figure 1-2). The T-54/55 is a non-amphibious MBT built in the Soviet Union, China (as type 59), Czechoslovakia and Poland.

(1) Variants. A number of variations are discussed in the following subparagraphs:

(a) T-54 Earlier Models. An early T-54 had a distinctive bulbous shape at its turret rear and lacked a snorkel. Another model had a 12.7-mm Dshkm machine gun at the right cupola and another version, the T-54A, was fitted with a D10TG gun. The T-54B, which followed, was fitted with a 100-mm D10T2S.

(b) T-55. The T-55, unlike the T-54, lacks a loader's cupola or 12.7-mm Dshkm anti-aircraft machine gun (fitted to some models) and a turret dome ventilator. A later model, the T-55A, has readily identifiable differences from earlier models. These differences include

- a 7.62-mm PKT gun replacing the 7.62-mm SGMT gun.
- the elimination of the 7.62-mm bow machine gun.
- a smooth, not bolted, commander's cupola.
- an improved deep-fording capability.
- raised loader and driver hatch covers.

(c) T-54/T-55 (Egyptian). Many of these T-54s/T55s were fitted with a German AEG infrared/white searchlight to the left of the main armament and a Yugoslav Iskra laser rangefinder.

(d) Modernized T-54/T-55 MBTs. Some Warsaw Pact armies are upgrading their T-55 tanks to a new configuration called the T-55 AM, which includes smoke grenade launchers and a laser rangefinder mounted over the 100-mm gun. Horseshoe type armor is mounted around the front half of the turret and skirts for the upper part of the suspension are installed.

(e) Production Differences. Polish-produced tanks often have different stowage arrangements. The arrangement includes a rectangular box mounted on the left

side of the turret, a smaller square stowage box on the left side of the turret-rear, and a slightly different rear decking.

(f) Armored Recovery Vehicles (ARVs). A variety of T-54/T-55s have been modified to ARVs for towing, pushing, and lifting operations. Most modifications are identified by tool and specialized equipment stowage and platforms, small and large cranes, winches, pushbars, cable-drums, spades, and dozer blades mounted strategically on the hull. Small tripod jib cranes can be erected on some versions and some modifications require the turret to be removed. Other versions have a distinctive commander's cupola on the forward right side of the hull.

(g) Bridging Tanks. Soviet, Czechoslovak, and Polish bridgelayers are built on earlier T-34 and T-54 tank chassis. The bridges launch hydraulically over the front of the vehicles and fold up when not in use to reduce vehicle length when travelling. Fully open, the bridges range in size from 12.3 to 21.6 meters and can span obstacles from 11 to 20 meters.

(h) Combat Engineer Vehicle (IMR). The IMR is essentially a T-55 that had its turret replaced with a hydraulically-operated crane. The crane can also be fitted with a small bucket or a pair of pincer type grabs for removing trees and other obstacles. A hydraulically-operated dozer blade mounts to the front of the hull; it can be used in a straight or Vconfiguration only and cannot angle doze.

(i) Dozer T-54. This T-54 can be fitted with bulldozer blades for clearing soil, obstacles and snow.

(j) Mine-clearing Tanks (Czechoslovakian and Soviet). T-54/T-55 Mine-clearing Tanks can be fitted with a wide range of mine-clearing equipment including singular and combined roller and plough type systems mounted on the front of the hull. Some lack turrets while others have built-up superstructures. On some versions, the driver sits at the front right of the turret while on others, the driver's position has been raised and moved to the rear as a new cupola with a 12.7-mm machine gun. Turrets on some models are believed to be armed with a 14.5-mm KPVT heavy machine gun replacing the normal 12.7-mm gun.

A more recent mine-clearing development is the rear-mounted rocket-propelled charges. The charges are launched across a minefield and once on the ground, are detonated.

(k) Flamethrower TO-55 (Soviet). The TO-55 flamethrower is in service with the Soviet Army and Naval infantry. The flamethrower has a maximum range of 200 meters and replaces the 7.62-mm coaxial machine gun while the 100-mm gun is retained.

(l) T-54 and T-55 (Israeli). Israel captured a number of T-54 and T-55 tanks and modified them for their own use. Some of the modifications included the



replacement and/or installation of additional track storage and included replacing existing armament with some of the following armament types:

- 105-mm M68 rifled guns.
- 7.62-mm (0.30) Browning machine guns.
- 12.7-mm (0.50) Browning M2 HB machine guns.
- Browning 0.30 machine guns at loaders' stations.
- Modified 105-mm ammunition racks.

Israeli modified T-54s and T-55s are redesignated TI-67s.

(m) T-54/T-55/T-62 Model S (Israeli). These models have many other improvements including blazer explosive reactive hull and turret armor.

(n) Other Variances. Some T-54s have only four road wheels on each side. Others have a twin 57-mm self-propelled, automatic, anti-aircraft gun system sitting in an open-topped turret. A standard 12.7-mm (0.50) Browning M2 HB machine gun has replaced some Soviet equipped 12.7-mm DShKm anti-aircraft machine guns. In India, sheet steel tubes are placed on 100-mm barrels to distinguish Indian T-54/T-55 tanks from Pakistani T-59s.

(2) Recognition Features (Basic Models). Basic T-54/T55 models have

- five single rubber-tired road wheels each side with a distinctive gap between the first and second road wheels. The drive sprocket is at the rear, idler at the front and no track return rollers. Hydraulic shock absorbers are mounted on the first and fifth road wheel stations.
- four flat steel tanks on the right running board. Optional drum-type fuel tanks can also be fitted on the rear.
- three stowage boxes on the left running board.
- front climbing handles on the turret.
- an unditching beam mounted at the hull rear.
- a straight splash plate.
- a low-silhouetted, sloped hull.
- a half-egged shaped turret (view from side.)
- two snorkels: a thin one for operational use and a large diameter one for training. The operational snorkel mounts over the loader's periscope and when not used is disassembled and carried at the rear of the turret or hull. The large diameter snorkel mounts over the loader's hatch cover.

- a commander's cupola with a single hatch cover that has a periscope on each side and a infrared searchlight mounted on the forward part.
- an infrared searchlight to the right of the main armament.
- a driver's hatch cover with two periscopes mounted forward.
- a loader's hatch cover with a single periscope mounted to the right of the turret.
- an infrared light mounted to the right of the glacis plate.

(3) Vehicle Characteristics (Basic T-54/T-55 Models). T-54/T-55 basic models have all-welded hulls divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine at the rear. T-54/T55s have four-man crews with the tank commander and gunner sitting on the left side of the turret with the gunner in front. Both the T-54 and T-55 have smoke-laying capabilities. Specifications for the T-54/T-55 are provided in the lists and paragraphs that follow.

#### T-54/55 Measurements

<u>Combat weight</u> , 36,000 kg.	<u>Total fuel capacities</u> , 812/960 liters.
<u>Hull length</u> , 6.45 meters.	<u>Maximum road ranges</u> , 400/500 km.
<u>Hull width</u> , 3.27 meters.	<u>Ranges with long range fuel tanks</u> ,
<u>Overall height</u> , 2.4 meters.	600/600 km
<u>Ground clearance</u> , 0.425 meters	<u>Maximum speed</u> , 48/55 km/h.
<u>Track width</u> , 580 mm.	

#### T-54/55 Armor

<u>Hull Armor Thickness</u>	<u>Turret Armor Thickness</u>
<u>Front upper</u> , 97 mm.	<u>Front</u> , 203 mm
<u>Front lower</u> , 99 mm.	<u>Sides</u> , 150 mm.
<u>Side upper</u> , 79 mm.	<u>Rear</u> , 64 mm.
<u>Side lower</u> , 20 mm.	<u>Roof</u> , 39 mm.
<u>Rear upper/lower</u> , 46 mm.	
<u>Front/rear floor</u> , 20 mm.	
<u>Top</u> , 33 mm.	

(4) Vehicle Capabilities. Basic T-54 and T-55 models can

- cross a 2.85-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- ford 1.27 meters without snorkel.
- ford 4.546 meters with preparation.

(5) Armament Characteristics (T-54/T-55 Basic Models). Basic T-54/T-55s have two layers of armament: main and secondary.

(a) Main Armament. The T-54 and T-55 basic models have the same main armament: a 100-mm D-10T (originally M1944) rifled tank gun with a length of 5.608 meters and a bore evacuator (fume extractor) at the end of the barrel. An average rate of fire for a T-54 is four rds/min with an ammunition load of 34 rounds for the T-54 and 43 rounds for the T-55.

(b) Secondary Armament. Secondary armament for the T-54 and T-55 is a 7.62-mm SGMT machine gun mounted coaxially to the main armament on the right side. The T-54 has two additional weapons: a similar 7.62-mm machine gun fixed in the center of the glacis plate and a 12.7-mm DShKM anti-aircraft machine gun mounted at the loader's position. The T-55 does not have an anti-aircraft machine gun installed.

(6) Recognition Features (T-54/T-55 105-mm Gun Models). When modified with the 105-mm gun, these T-54/T-55s share the same characteristics as stated above for basic models with some exceptions, which are discussed in the following paragraphs.

(7) Vehicle Characteristics (105-mm Gun Models). The combat weights of these T-54/T-55 versions are approximately 36,000 kg. Lengths of both versions forward are 9.20 meters and in travel, 8.20 meters. Overall heights for both vehicles are the same at 2.85 meters. The width of each tank is 3.28 meters with a ground clearance of 0.45 meters and tracks of 2.63 meters.

(8) Vehicle Capabilities (105-mm Gun Models). Modified 105-mm T-54/T-55s can

- cross a 2.70-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 30-percent side slope.
- ford 1.27 meters without snorkel.

The maximum speed of the modified T-54 is 43 km/h while the modified T-55 can attain a maximum speed of 45.48 km/h.

(9) Armament Characteristic (105-mm Gun Models). These modified T-54/T-55s have two layers of armament: main and secondary.

(a) Main Armament. Main armament for both the modified T-54 and T-55 is the 105-mm gun.

(b) Secondary Armament. Modified T-54 and T-55 tanks have identical secondary armament: a 7.62-mm machine gun mounted coaxially to the main armament and a 7.62-mm antiaircraft gun.

(10) Countries Served. T-54 and T-55 tanks are in service with the following countries:

Afghanistan  
Albania

Egypt  
Equatorial Guinea

Korea, North  
Lebanon

Somalia  
Sudan

Algeria	Ethiopia	Libya	Syria
Angola	Bangladesh	Mali	Tanzania
Bulgaria	Finland	Mongolia	Togo
Central African Republic	Guinea	Mozambique	USSR
China	Hungary	Nicaragua	Vietnam
Congo	India	Nigeria	Yemen, North
Cuba	Iran	Pakistan	Yemen, South
Czechoslovakia	Iraq	Peru	Yugoslavia
Germany, (East)	Israel	Poland	Zambia
	Kampuchea	Romania	Zimbabwe

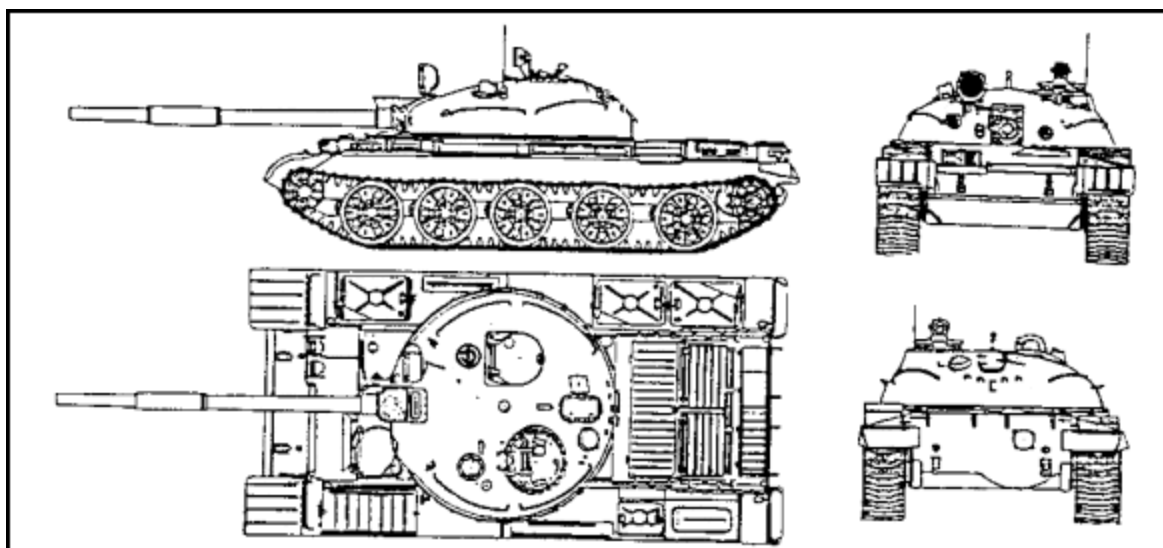


Figure 1-3. Soviet T-62 MBT.

c. T-62 Main Battle Tank (Figure 1-3). The T-62 MBT was developed from earlier T-54/T-55s. However, the T-62 has a longer and wider hull, different spacing on the road wheels (A distinct gap is located between the third and fourth and fourth and fifth road wheels.), different turret shape, and a longer and fatter gun barrel with a fume extractor towards its muzzle.

(1) Variants. A number of T-62 variations are discussed in the following subparagraphs:

(a) T-62M (NATO T-62A). The main recognition differences between the T-62 and the T-62M are the contour and size of the turret and the replacement of the fixed loader's hatch with a rotating cupola mounting a 12.7-mm DShKM antiaircraft machine gun. The 12.7-mm DShKM can only be used from outside the tank. Some machine gun ammunition boxes are stored externally on the right of the turret. The T-62 can be fitted with mine-clearing equipment like that fitted to the T-54/T-55. Currently, the T-62 is being updated with new components.

(b) Egyptian T-62s. Some of these T-62s are fitted with Sakr ground-to-ground smoke rocket launchers.

(c) T-62K Command Tank. T-62K variances are specifically in the areas of internal communications and navigation.

(d) TO-62 Flamethrower. The TO-62 flamethrower is in Soviet service. The flame gun has an effective range of 100 meters and is mounted coaxially with the 115-mm gun.

(e) Modified T-62 MBTs. A number of T-62 tanks have been fitted with additional armor protection for the fuel tanks, above the road wheels, glacis plate, and each side of the 115-mm gun halfway round the turret. The additional turret armor is fitted passively to the turret. Some T-62 tanks were fitted with missile launchers on the rear of the turret for air defense, but it is not known if these were ever deployed operationally.

(f) RO 115-mm Tank Barrel. British Royal Ordnance has provided substantial quantities of 115-mm tank barrels to Egypt for replacement of the existing T-62 115-mm U-5TS guns.

(g) T-62 with 105-mm L7 Gun. In this conversion, a 105-mm L7 rifled tank gun replaces the standard 115-mm U-5TS gun.

(h) T-62 with GIAT 120-mm Smoothbore Gun. In this conversion, a GIAT 120-mm smoothbore gun replaces the 115-mm gun.

(i) M1977 Armored Recovery Vehicle (ARV). These ARVs are limited to towing operations and as far as it known, they are not fitted with winches or other specialized recovery equipment.

(2) Recognition Features. The T-62 has

- five twin rubber-tired road wheels on each side with the drive sprocket at the rear, idler at the front and no track return rollers. A hydraulic shock absorber is also provided at the first and last road wheel stations.
- three external diesel fuel tanks on the right side and a single auxiliary oil tank on the left side. The T-62 also has two optional drum-type fuel tanks that can be fitted on the rear of the vehicle for an increased operational range.
- an unditching beam mounted at the hull rear.
- two snorkels, a thin one for operational use and a large diameter one for training. The operational snorkel is disassembled and carried at the turrets rear when not in use.
- a longer hull and gun tube than the T-54/T-55.
- a rounded turret (view from side).
- a low-silhouetted hull.

- a commander's cupola that is further back on the turret than the loader's hatch. The cupola has four periscopes; two in the hatch cover and two in the forward part of his cupola.
- a drivers single-piece hatch cover.
- two periscopes for the gunner, one of which is used in conjunction with the main searchlight mounted coaxially to the right of the main armament.
- a loader's single hatch cover to the right of the turret with a periscope that can be used to the front or rear.
- a straight splash plate mounted on the front of the vehicle with a white light and an infrared headlamp mounted to the rear of the deflector.
- front-climbing curved handles on the turret.
- turret rails for infantry or personal equipment.
- a box-like radiation detector/actuator mounted on the right side of the turret behind the compressed air tanks.
- a blower mounted at the rear of the turret to the left of the spent cartridge ejection door.

(3) Vehicle Characteristics. The T-62 has an all-welded hull divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The T-62 has a four-man crew consisting of the tank commander, driver, gunner and loader. The tank commander is seated on the left and the driver is seated in the front of the vehicle on the left side. The T-62 also has smoke-laying capabilities. Specifications that apply to the T-62 are provided in the lists and paragraphs that follow.

#### T-62 Measurements

Combat weight, 40,000 kg.  
Hull length, 6.63 meters.  
Hull width, 3.3 meters.  
Overall height, 2.395 meters.  
Ground clearance, 0.43 meters.  
Track, 2.64 meters  
Track width, 580 mm.  
Track length on ground, 4.15 meters.

Total capacity  
internal/external/supplemental fuel tanks,  
 675/285/400 liters.  
Normal on/off-road range, 450/320 km.  
Maximum on/off-road range with long  
range fuel tanks, 650/450 km  
Maximum speed, 50 km/h.

## T-62 Armor

### Hull Armor Thickness

Front upper, 102 mm.  
Front lower, 102 mm.  
Sides upper, 79 mm.  
Sides lower, 15 mm.  
Rear upper/lower, 46 mm.  
Front/rear floor, 20 mm.  
Top, 31 mm

### Turret Armor Thickness

Front, 242 mm  
Sides, 153 mm.  
Rear, 97 mm.  
Roof, 40 mm.  
Hatches, 30/31 mm.

#### (4) Vehicle Capabilities. The T-62 can

- cross a 2.85-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- ford 1.4 meters without snorkel.
- ford 5.5 meters with snorkel.

#### (5) Armament Characteristics. The T-62 has two layers of armament: main and secondary.

(a) Main Armament. The main gun is a U-5TS (2A20) 115-mm smoothbore gun with an average rate of fire of four rds/min and a main ammunition load of 40 rounds.

(b) Secondary Armament. T-62 secondary armament consists of a 7.62-mm PKT machine gun mounted coaxially to the right of the main armament.

#### (6) Countries Served. T-62 tanks are in service with the following countries:

Afghanistan	Ethiopia	Korea, North	Vietnam
Algeria	Germany, (East)	Libya	Yemen, North
Angola	Iran	Mongolia	Yemen, South
Cuba	Iraq	Syria	
Egypt	Israel	USSR	

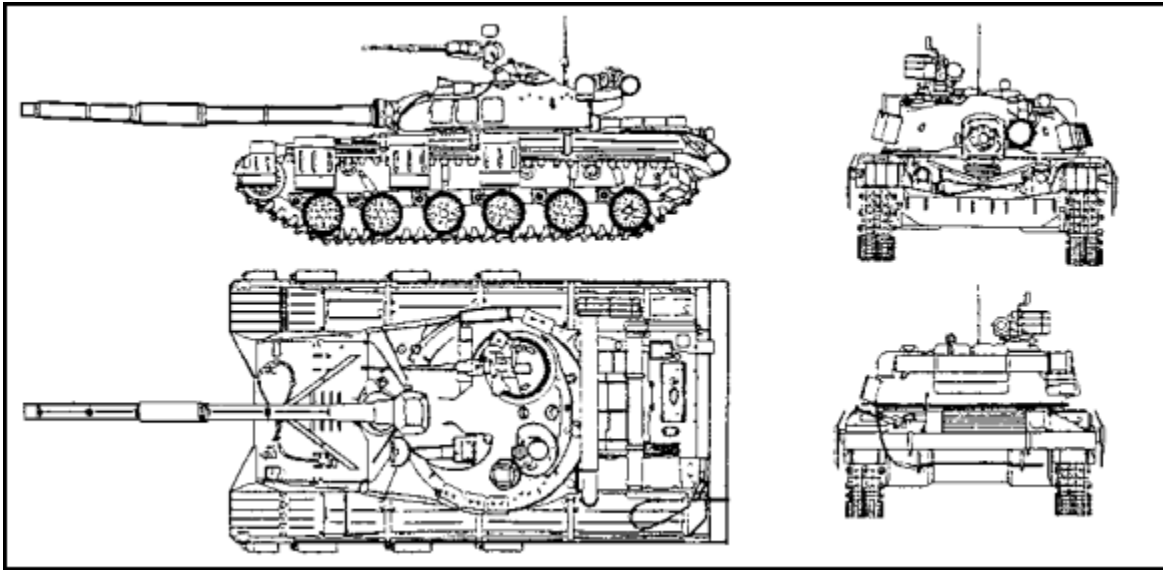


Figure 1-4. T-64 with 12.7-mm machine gun.

d. T-64 Main Battle Tank (Soviet) ([Figure 1-4](#)). Initially, problems were encountered with a number of T-64 components, which resulted in the T-64 not being considered a satisfactory design. However, the T-64A and T-64B, later production models, are in service with the Western Group of Forces. In this lesson the T64B, although a T-64 variant, is presented as the primary T-64 model. Both vehicles are basically the same and have

- a modified gunner sight.
- a bump stop for the fourth road wheel.
- hinges for the attachment of side skirts.
- six smoke mortars on each side of the turret.

(1) Variant. The T-64K command version, when stationary, is fitted with a 10-meter telescopic mast that is erected over the turret and held in position by stays that are pegged to the ground. The T-64K command version is not normally fitted with the 12.7-mm anti-aircraft gun.

(2) Recognition Features. The T-64B has

- six small evenly-spaced dual road wheels on each side with the drive sprocket at the rear, idler at the front and four return rollers. A hydraulic shock absorber is also provided at the first, second, fifth and sixth road wheel stations.
- a sharply-sloped upper glacis with V-shaped water and debris deflector.
- ammunition/storage boxes on the turret sides.
- optional drum-type fuel tanks that can be fitted.
- an infrared searchlight mounted on the left side of the main armament.



- integrated fuel cells and storage containers that give a streamlined appearance to the fenders.
- two snorkel types for deep fording, one fitted to the turret and the other over the engine compartment. The snorkels are carried on the top of the turret at the rear.

(3) Vehicle Characteristics. At least two versions of the T-64B are in operation: the new construction version, which lacks the forward gunner's sight, and the rebuilt version, which retains the gunner's sight. The T-64B has an all-welded hull divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The T-64B has a crew of three. Specifications that apply to the T-64B are provided in the lists and paragraphs that follow.

#### T-64B Measurements

Combat weight, 42,000 kg.

Hull length, 7.4 meters.

Hull width with/without skirts, 4.64/3.38 meters.

Height without AA MG, 2.2 meters.

Ground clearance, 0.377 meters.

Track width, 580 mm.

Track length on ground, 4.4 meters.

Total fuel capacity all tanks, 1,000 liters.

Normal road range, 400 km.

Maximum road range with long range fuel tanks, 600 km

Maximum road speed, 75 km/h.

(4) Vehicle Capabilities. The T-64B can

- cross a 2.72-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.4 meters without snorkel.
- ford 5.5 meters with snorkel.

(5) Armament Characteristics. The T-64B has two layers of armament: main and secondary. The T-64B also has explosive reactive armor (ERA).

(a) Main Armament. Main armament is a 125-mm 2A26 smoothbore gun/missile launcher. The 125-mm gun can achieve a rate of fire of six to eight rds/min. The 125-mm ordnance can also fire the AT-8 Songster ATGW missile.

(b) Secondary Armament. The T-64B's secondary armament consists of a 12.7-mm anti-aircraft gun machine gun that can be aimed and fired from within the tank and a 7.62-mm machine gun mounted coaxially to the main armament. Two or three boxes of 12.7-mm ammunition are mounted on the left side of the turret.

(6) Country Served. The T-64 is in use only with the Soviet Union.

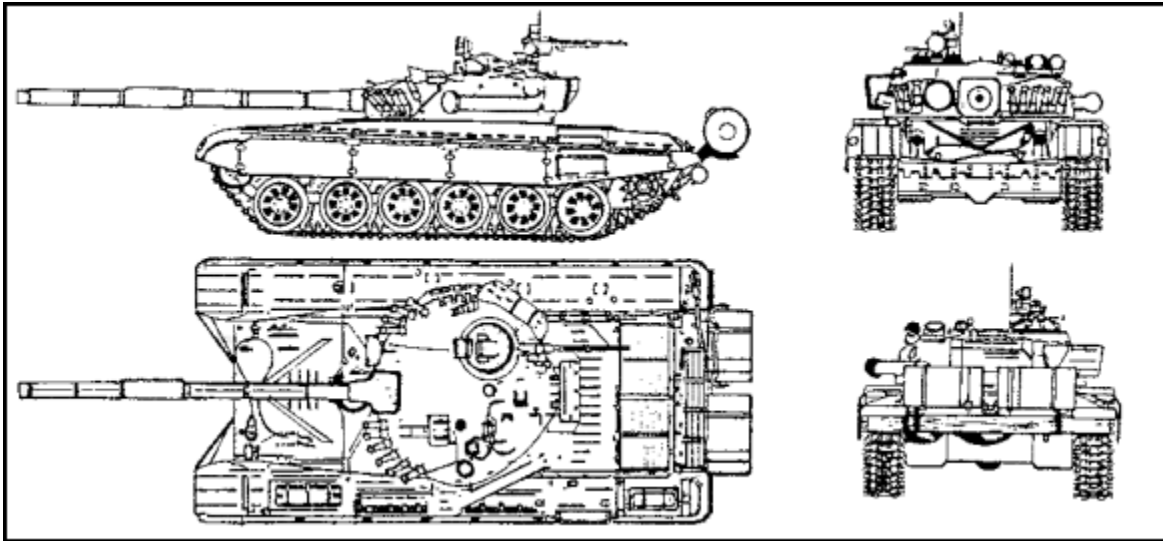


Figure 1-5. T-72M1 MBT with smoke dischargers.

e. T-72 Main Battle Tank (Figure 1-5). Since the Soviet built T-72 entered production, many improvements have been made to the vehicle, making it difficult to distinguish individual versions of the tank. Improvements include: increased protection, better mobility, and enhanced firepower. A late production model, the T-72M1 ([Figure 1-5](#)), is fitted with smoke dischargers on the turret: seven on the left side and five on the right side.

(1) Variants. The following variants summarize some of the key distinguishing features:

(a) T-72 with ERA. This T-72 is fitted with explosive reactive armor (ERA) arrays similar to those installed on the T-64 and T-80 series MBTs. To fit the mounting points for ERA, eight forward-firing smoke mortars have been repositioned to the left side of the turret and the distinctive V-shaped splash plate on the glacis has been removed.

(b) BREM-1 Armored Recovery/Repair Vehicle (ARRV). This ARRV is equipped with a hydraulic crane, capable of lifting 12 tons, mounted at the front of the hull on the left side. Other equipment includes a main winch with a capacity of 25 tons that can be increased to 100 tons, an auxiliary winch, a hydraulically operated dozer/stabilizing blade at the front of the hull, towing equipment, and a complete range of tools and recovery equipment. This vehicle is known to be used in (East) Germany.

(c) IMR-2 Combat Engineer Vehicle. The IMR-2 is believed to be the replacement for the T-55 IMR. A crane is mounted that can be fitted with a number of attachments including pincers for uprooting trees. At the front of the vehicle is a dozer blade that can be used in a straight or V-configuration.

(2) Recognition Features. The T-72 has

- six large evenly-spaced road wheels on each side with the drive sprocket at the rear, idler at the front and three return rollers.

- two optional drum-type fuel tanks that can be fitted to the vehicle for an increased operational range.
- a unditching beam carried at the rear.
- a snorkel for deep fording that is carried on the left side of the turret to the rear.
- a commander's cupola with a periscope and an infrared searchlight on each side.
- a gunner's hatch mounted with two observation periscopes. An infrared searchlight is mounted in front and to the left of this hatch along with a laser rangefinder.
- another infrared searchlight mounted on the right side of the main armament.
- a single loader's hatch to the right of the turret with a periscope that can operate to the front or rear.
- a driver's single hatch cover, in front of which is a wide-angle observation periscope.
- two light-steel stowage boxes mounted on the turret, one at the rear and the other on the right.
- integrated fuel, oil and storage containers along each side of the hull that give the fenders a streamlined shape.
- an oil cell and stowage boxes on the top left side of the hull.
- four removable armored skirt plates fitted over the forward part of the track for additional protection.
- a dozer blade mounted under the nose.
- optional mine-clearing equipment.
- a searchlight and infrared headlamp mounted to the rear of the deflector, on the right side.
- turret rails.
- a box-like radiation detector/actuator mounted on the right side of the turret behind the compressed air tanks.
- a blower mounted at the rear of the turret.
- a sharply-sloped glacis made of a new laminate armor 200-mm thick and a V-shaped water and debris deflector mounted to the glacis plate.

(3) Vehicle Characteristics. The T-72's all-welded hull is divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The T-72 has a three-man crew. The tank commander and gunner sit in the turret with the commander on the right and the gunner

on the left. Specifications that apply to the T-72 are provided in the lists and paragraphs that follow.

#### T-72 Measurements

<u>Combat weight</u> , 41,000 kg.	<u>Track length on ground</u> , 4.25 meters.
<u>Hull length</u> , 6.95 meters.	<u>Total fuel capacity all tanks</u> , 1,000 liters.
<u>Hull width with/without skirts</u> , 4.75/3.6 meters.	<u>Normal road range</u> , 480 km.
<u>Height without AA MG</u> , 2.37 meters.	<u>Maximum road range with range fuel tanks</u> , 700 km.
<u>Ground clearance</u> , 0.47 meters.	<u>Maximum road speed</u> , 80 km/h.
<u>Track width</u> , 580 mm.	

Turret armor is believed to be 280-mm thick while the nose is 80mm thick.

(4) Vehicle Capabilities. The T-72 can

- cross a 2.7-meter trench.
- mount a 0.85-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.4 meters without snorkel.
- ford 5.5 meters with snorkel.

(5) Armament Characteristics. The T-72 has two layers of armament: main and secondary.

(a) Main Armament. Main armament is a 125-mm 2A46 smoothbore gun which can fire eight rds/min with an ammunition load of 39 rounds and a range of 2,000 meters.

(b) Secondary Armament. T-72 secondary armament consists of a 12.7-mm anti-aircraft NSVT machine gun mounted on the commander's cupola and a 7.62-mm PKT machine gun mounted coaxially to the main armament. (The 12.7-mm gun is a new design turret machine gun that has no provision for firing from inside the tank. It can only be used with the commander exposing the upper part of his body.)

(6) Countries Served. T-72 MBTs are service with the following countries:

Algeria	Czechoslovakia	India	Romania
Angola	Finland	Libya	Syria
Bulgaria	Germany, (East)	Iraq	USSR
Cuba	Hungary	Poland	Yugoslavia

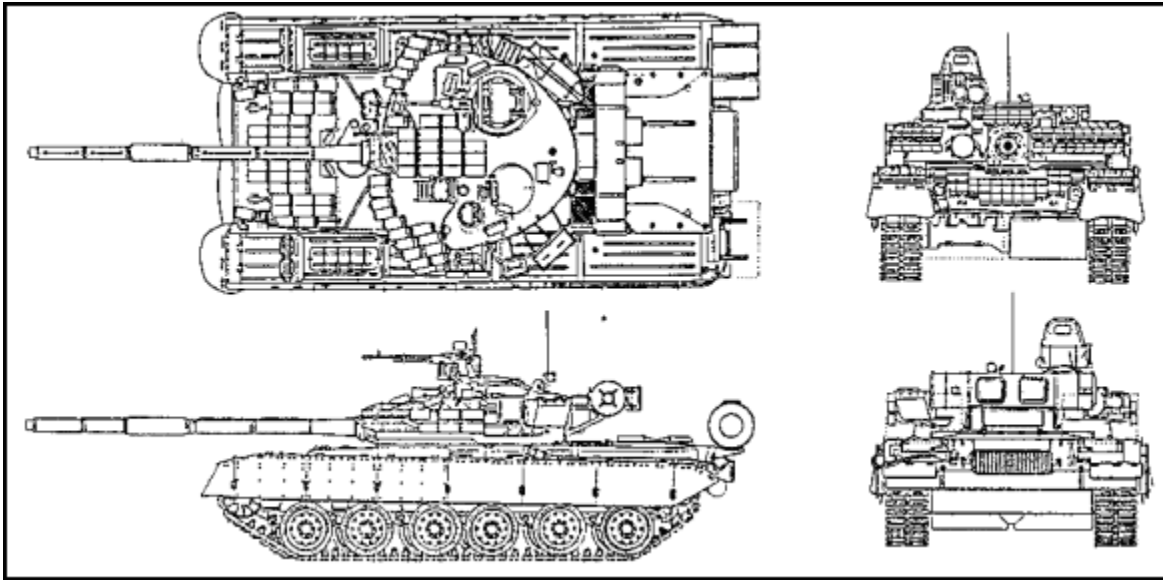


Figure 1-6. T-80 Main Battle Tank with Explosive Reactive Armor.

f. T-80 Main Battle Tank (Soviet) ([Figure 1-6](#)). The T-80 is the main battle tank in first echelon threat units and has been deployed to units in (East) Germany and other Soviet units which had not been supplied T-64 MBTs. Apparently the T-80 is only being deployed with Soviet rather than Warsaw Pact forces. The track of the T-80 is slightly wider than the T-64 and has a longer length of track on the ground. The T-80 is believed to have reverted to torsion bar suspension like that fitted to the T-72 as opposed to the T-64, which has hydro-pneumatic suspension. A distinct spacing is noted between the second and third, fourth and fifth, and fifth and sixth road wheels.

(1) Variants. A number of variants have been observed and are discussed in the following subparagraphs.

(a) T-80 M-1981/3. This version was first thought to be another variant of the diesel-powered T-72.

(b) T-80 M-1983/1. A gas-turbine-powered version.

(c) T-80 Model 1984. This version can be fitted with smoke grenade launchers on each side: five on the left and four on the right of the main armament.

(d) T-80 Command Version. While unknown, there is probably a command version of the T-80 with a laser designation system mounted on the commander's cupola; the system would be protected by a rectangular armored box cover.

(2) Recognition Features. The T-80 is very similar to the older T-72 and incorporates some features of the T-64. It also has its own unique characteristics. The T-80 has

- six large evenly-spaced rubber-tired road wheels that are bolted together in two halves with the drive sprocket at the rear, idler at the front and three track return rollers. The new tracks are fitted with rubber pads.

- two snorkels: a large one for the gas turbine, and another one for the radiator grill. Both are carried at the turret rear in a large circular container.
- a distinct oblong exhaust at the hull rear.
- a dozer blade under the vehicle's nose.
- a unditching beam carried across the hull rear.
- a laser warning device at the rear hull.
- three rather than four deflection bars in front of the driver's hatch.
- an infrared searchlight mounted on the right side of the main armament.
- enhanced frontal armor and side skirts.
- twelve turret-mounted smoke dischargers, seven on the left side and five on the right.
- optional fuel tanks for rear hull mounting.
- integrated fuel cells and storage containers that give the fenders a streamlined shape.
- a sharply-sloped laminate type glacis plate for improved protection against kinetic energy and HEAT attack.
- a removable missile guidance box mounted on the right side of the turret roof in front of the commander's cupola.

(3) Vehicle Characteristics. The overall layout of the T-80 is similar to the T-64 series with the driver's compartment at the front, two man turret in the center and engine and transmission at the rear. The T-80 has a three-man crew. The tank commander and gunner sit in the turret with the commander on the right and the gunner on the left. Specifications that apply to the T-80 are provided in the lists and paragraphs that follow.

#### T-80 Measurements

Combat weight, 42,000 kg.

Hull length, 7.4 meters.

Hull width, 3.4 meters.

Height without AA MG, 2.2 meters.

Ground clearance, 0.38 meters.

Track width, 580 mm.

Track length on ground, 4.4 meters.

Total fuel capacity all tanks, 1,400 liters.

Normal road range, 400 km.

Maximum road range with long range fuel tanks, 600 km

Maximum road speed, 75 km/h.

When fitted with explosive reactive armor, the smoke grenade launchers are moved from each side of the main armament back to each side of the turret and positioned between the turret side and the explosive reactive panels. The T-80 is virtually immune to penetration from all current NATO ATGWs which rely on a HEAT warhead to penetrate armor. The armor does not provide protection against APDS or APFSDS attack.

(4) Vehicle Capabilities. The T-80 can

- cross a 2.9-meter trench.
- mount a 0.9-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.4 meters without snorkel.
- ford 5.5 meters with preparation.

(5) Armament Characteristics. The T-80 has two layers of armament: main and secondary.

(a) Main Armament. The T-80 uses a 125mm 2A46 smoothbore gun that can fire four types of separate loading ammunition with a range of 2,500 meters. The T-80 also fires the AT-8 Songster ATGW missile. The 125-mm gun/missile launcher tube is fitted with a thermal sleeve and a fume extractor. There is a possibility that only a part of the T-80 fleet is equipped to fire the AT-8 Songster ATGW. The ammunition load for the 125-mm gun depends on mission requirement for standard rounds and the AT-8 Songster ATGW. A normal 125-mm ammunition load is 40 rounds.

(b) Secondary Armament. Secondary armament consists of a 12.7-mm anti-aircraft NSVT machine gun mounted on the commander's cupola. This weapon can only be used with the commander exposing the upper part of his body. Also, a 7.62-mm PKT machine gun is mounted coaxially to the right of the main armament.

(6) Countries Served. T-80 MBTs are in service with Soviet forces only in the Soviet Union and (East) Germany

g. M-84 Main Battle Tank (Yugoslavian). Recognition features and vehicle characteristics for the Yugoslavian built M84 are virtually the same as those stated for the late production Soviet T-72 MBT ([Figure 1-5](#)) with two banks of smoke dischargers mounted on the turret front: seven on the left and five on the right.

(1) Vehicle Characteristics. Specifications for the M-84 are presented in the lists and paragraphs that follow.

#### M-84 Measurements

Hull length Forward with (without unditching beam or long range fuel tanks),  
9.53 meters.  
Width overall, 3.57 meters.

Height to turret roof, 2.19 meters.

Ground clearance, 0.428 meters.

Track, 2.79 meters.

Track length on ground, 4.27 meters.

(2) Vehicle Capabilities. The M-84 can

- cross a 2.8-meter trench.
- mount a 0.85-meter vertical step.

- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.2 meters without snorkel.
- ford 1.8 meters with five minutes preparation.
- ford 5 meters with 20 minutes preparation.

(3) Armament Characteristics. M-84 main and secondary armament is the same as that for the T-72 MBT.

(4) Countries Served. The M-84 MBT is in service with the Yugoslavian Army and is being offered for export.

h. T-74 Main Battle Tank (Soviet). Recognition features and vehicle characteristics for the T-74 are the same as those stated for the late production T-72 MBT ([Figure 1-5](#)) and the M-84 stated above. No further recognition and vehicle characteristics or exceptions for the T-74 will be discussed in this lesson.

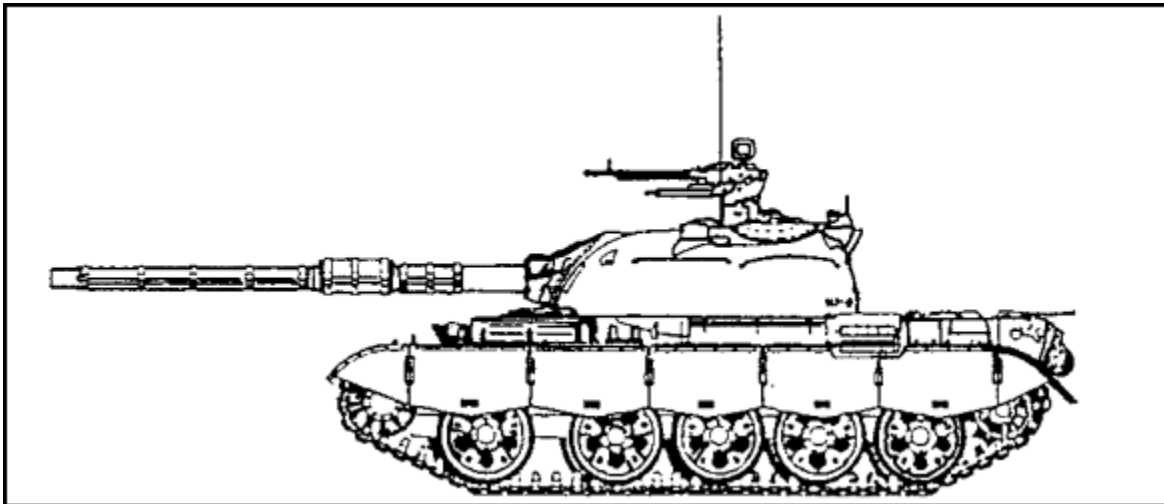


Figure 1-7. Type 59 MBT with 100-mm Gun.

i. Type 59 Main Battle Tank (China) ([Figure 1-7](#)). The Type 59 MBT was developed from earlier Soviet supplied T-54s and later model T-54As. In many aspects, the Chinese Type 59 and Soviet T54s are similar.

(1) Variants. A number of Type 59 modifications and variations are presented in the following subparagraphs:

- (a) NORINCO Type 59 Retrofit Package. In addition to internal engineering and equipment changes, a new 100-mm gun stabilized in both elevation and traverse has been installed on this version.
- (b) Type 59 with 105-mm gun. This gun is believed to be a western 105-mm rifled tank gun fitted with the normal fume extractor and thermal sleeve.
- (c) Type 59 with 105-mm L7 gun. The United Kingdom has fitted this type 59 with the 105-mm L7A3 rifled tank gun.



(d) Type 59 MBT with IR18 Thermal Imager (UK). This United Kingdom owned Type 59 was fitted with a IR18 based thermal fire control system. The thermal sensor for the system was mounted on a bracket on the left side of the mantlet and moves with the 105-mm gun.

(e) Type 59 Chassis with Marksman Turret. This type 59 version was fitted with a twin 35-mm air defense turret.

(f) Type 59 Basic ARV. This ARV is essentially a Type 59 with its turret removed. The vehicle is armed with a single 12.7-mm machine gun. This ARV is not believed to have a winch and is limited to towing operations.

(2) Recognition Features. The Type 59 is similar to the Soviet T-54 and shares many of the same characteristics. More recent T-59 production models have

- infrared searchlights for the commander and gunner.
- a larger infrared searchlight mounted above the main armament that moves in elevation with the main armament.
- a laser rangefinder (fitted to some models) right of the infrared searchlight mounted over the main armament.
- new night vision equipment that includes new periscopes for the commander, gunner and driver (fitted on thirty models only).

(3) Vehicle Characteristics. The overall layout of the Type 59 is similar to the T-54 series with the driver's compartment at the front, fighting compartment in the center and engine and transmission at the rear. The Type 59 has a four-man crew. Specifications that apply to the Type 59 are provided in the lists and paragraphs that follow.

#### Type 59 Measurements

Combat weight, 36,000 kg.

Hull length, 6.04 meters.

Hull width, 3.27 meters.

Height, 2.2 meters.

Ground clearance, 0.425 meters.

Track, 2.855 meters

Track width, 580 mm.

Track length on ground, 3.84 meters.

Fuel capacity main tanks, 815 liters.

Fuel capacity external tanks, 400 liters.

Normal road range, 420-440 km.

Maximum road range with long fuel tanks, 600 km

Maximum road speed, 40-50 km/h.

## Type 59 Armor

### Hull Armor Thickness

Front upper, 97 mm.  
Front lower, 99 mm.  
Sides upper, 79 mm.  
Sides lower, 20 mm.  
Rear upper/lower, 46 mm.  
Front/rear floor, 20 mm.  
Top, 33 mm

### Turret Armor Thickness

Front, 203 mm  
Sides, 150 mm.  
Rear, 64 mm.  
Roof, 39 mm.

(4) Vehicle Capabilities. The Type 59 can

- cross a 2.7-meter trench.
- mount a 0.79-meter vertical step.
- climb a 60-percent grade.
- ford 1.4 meters without snorkel.
- ford 5.5 meters with preparation.

(5) Armament Characteristics. The Type 59 has two layers of armament: main and secondary.

(a) Main Armament. Main armament for the Type 59 consists of a 100-mm Type 59 rifled gun that fires both Chinese and NORINCO developed rounds. Normal ammunition load for the main armament is 34 rounds.

(b) Secondary Armament. Secondary armament consists of three weapons: a 12.7-mm anti-aircraft Type 54 machine gun, a 7.62-mm Type 59T machine gun at the bow and another 7.62-mm 59T machine gun mounted coaxially to the right of the main armament.

(6) Countries Served. Type 59 tanks are in service with the following countries:

Albania  
Bangladesh  
China

Congo  
Kampuchea  
North Korea

Pakistan  
Tanzania

Vietnam  
Zimbabwe

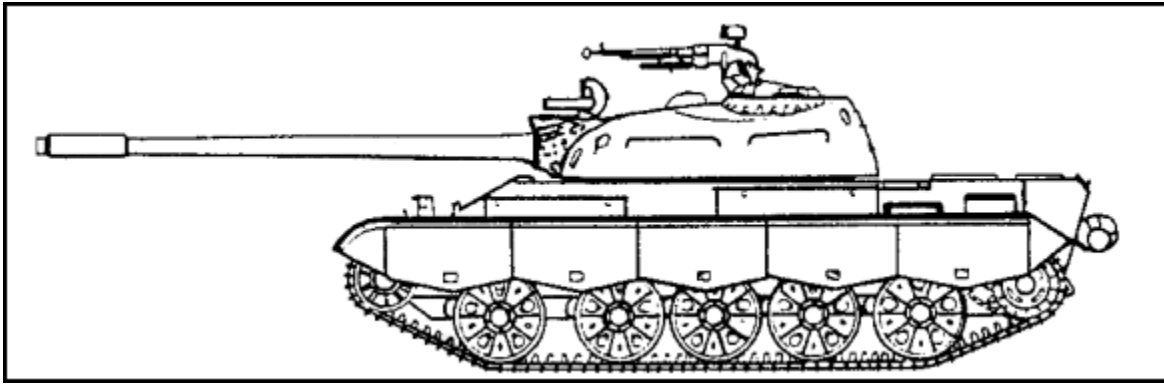


Figure 1-8. Type 69-II MBT with 100-mm Gun and Side Skirts.

j. Type 69 Main Battle Tank (China) (Figure 1-8). The Type 69 MBT was first produced with both smoothbore (Type 69-I) and rifled (Type 69-II) guns. After extensive testing, the rifled gun proved to be more accurate and had greater armor penetration characteristics. Smoothbore production was discontinued after only 150 such equipped Type 69s were built. The Type 69-I is a further development of the Type 59 and differs from it mainly in the areas of armament, fire control and night vision equipment. In this lesson, the Type 69-I is discussed as the basic type 69 and the Type 69-II is discussed as a variant. Actual layouts of the Type 69-I and Type 69-II MBTs are virtually identical and are not repeated in this lesson.

(1) Variants. The following variants summarize some of the key distinguishing features:

(a) Type 69-II. The Type 69-II is fitted with a 100-mm rifled gun firing Chinese developed ammunition. The gun is stabilized both horizontally and vertically and has an increased hit probability due to a new fire control system. In addition to basic equipment, the Type 69-II has side skirts and a laser rangefinder mounted externally above the 100-mm gun. Some Type 69s are fitted with an external stowage bin on the turret rear and armor protection for the anti-aircraft machine gun.

(b) Thai Army Type 69-II. The Thai Army have replaced the 12.7-mm armament on their Type 69-II with the US 12.7-mm M2 Browning machine gun.

(c) Twin 37-mm SPAGG. There are two versions of the Twin 37-mm SPAGG. The first version sits in a power operated two man turret that is essentially built on a Type 69 tank chassis. This version has a four-man crew with the commander seated on the left and the gunner on the right with the Twin 37mm cannon between them. No radar is fitted to this version, making it a fair weather system only. The second version is armed with the same twin 37-mm cannon fitted with flash suppressors and a surveillance radar mounted on the turret rear. As far as is known, this version has yet to enter production.

(d) Twin 57-mm Type 80 SPAGG. The twin 57-mm Type 80 SPAGG is fitted on a modified Type 69-II MBT chassis with an open-topped turret. This vehicle has a six-man crew.

(e) Type 84 Armored Vehicle Launch Bridge (AVLB). The Type 84 AVLB is essentially a Type 69 MBT with its turret replaced with a bridge launching mechanism. The bridge launches over the front of the vehicle and when fully open can span a gap of up to 16 meters and support tracked and wheeled vehicles weighing up to 40 tons.

(f) Type 653 Armored Recovery Vehicle (ARV). The Type 653 ARV is based on the chassis of the Type 69 MBT. Besides recovering other vehicles on the battlefield, this ARV is designed to undertake major repairs such as changing powerpacks, clearing obstacles and preparing fire positions. Type 69 ARV standard equipment includes a front-mounted hydraulically-operated dozer blade, a hydraulic crane on the right side, a main winch with a capacity of 70 tons, an auxiliary winch, tools, tow bars and cables. A small quantity have been sold to Thailand.

(2) Recognition Features. The Type 69-I has

- a laser rangefinder mounted externally over the main armament in front of the mantlet.
- an infrared searchlight on the commander's cupola.
- an infrared searchlight above and to the immediate right of the main armament.
- an infrared driving light on each running board. o a coating of infrared reflecting paint.
- side skirts.

(3) Vehicle Characteristics. The Type 69-I has an all-welded hull that is divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine at the rear. The Type 69-I has a four-man crew. Specifications that apply to the Type 69-I are provided in the lists and paragraphs that follow.

#### Type 69-I Measurements

Combat weight, 36,500-37,000 kg.

Hull length, 6.243 meters.

Width over skirts/hull, 3.298/3.27 meters.

Height to axis of AA MG, 2.807 meters.

Ground clearance, 0.425 meters.

Track, 2.64 meters.

Track width, 580 mm.

Track length on ground, 3.845 meters.

Maximum road range, 420/440 km.

Maximum road speed, 50 km/h.

(4) Vehicle Capabilities. The Type 69-I can

- cross a 2.7-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.4 meters.

(5) Armament Characteristics. The Type 69-I has two layers of armament: main and secondary.

(a) Main Armament. Main armament is a 100-mm smoothbore gun with a bore evacuator near the muzzle. The ammunition load for the 100-mm gun is 34 rounds.

(b) Secondary Armament. Type 69-I secondary armament consists of a 12.7-mm anti-aircraft Type 54 antiaircraft machine gun mounted on the loader's cupola. A 7.62-mm machine gun is mounted coaxially to the main armament and another similar weapon is mounted in the bow. The Type 69-I can lay a smoke screen through the exhaust system on the left side.

(6) Countries Served. Type 69 MBTs are in service with China, Iraq and Thailand.

k. Type 79 Main Battle Tank (China). Recognition features and vehicle characteristics for the Type 79 are similar to some of the features on Type 59, Type 69 and Type 80 MBTs shown in [Figures 1-6](#), [1-7](#) and [1-8](#).

(1) Variants. None.

(2) Recognition Features. The Type 79 MBT has

- towing eyes under the nose of the tank.
- headlamp arrangements similar to the Type 80 MBT.
- a turret (slightly different than the Type 59/ 69) with a large rectangular window forward of the commander's cupola that could be an internally-mounted laser rangefinder.
- a bank of four electrically-operated smoke dischargers mounted on each side of the turret.
- a metal stowage box mounted to the rear of the smoke dischargers that is believed to house additional grenades.
- slight differences in the rear of the hull suggests a powerpack unlike the one used on the Type 59/Type 69.
- five removable skirts on the upper suspension.
- new tracks with removable rubber pads replacing the more normal all-steel tracks fitted to other Chinese MBTs.
- night vision equipment for the commander, gunner and driver.

(3) Vehicle Characteristics. The Type 79 chassis is similar to the Type 59/Type 69 and weighs 37.5 tons compared to the 36 tons on the Type 59. The Type 79 has a maximum road speed of 50 km/h. Other specifications of the Type 79 are presented in the lists and paragraphs that follow.

(4) Armament Characteristics. The Type 79 has two layers of armament: main and secondary.

(a) Main Armament. Type 79 main armament is a 105mm rifled tank gun that is provided with a fume extractor and a thermal sleeve.

(b) Secondary Armament. Type 79 secondary armament consists of a 12.7-mm machine gun mounted on the loader's cupola for local and anti-aircraft defense and a 7.62-mm machine gun mounted coaxially with the main armament.

(5) Countries Served. The Type 79 MBT is in service in China.

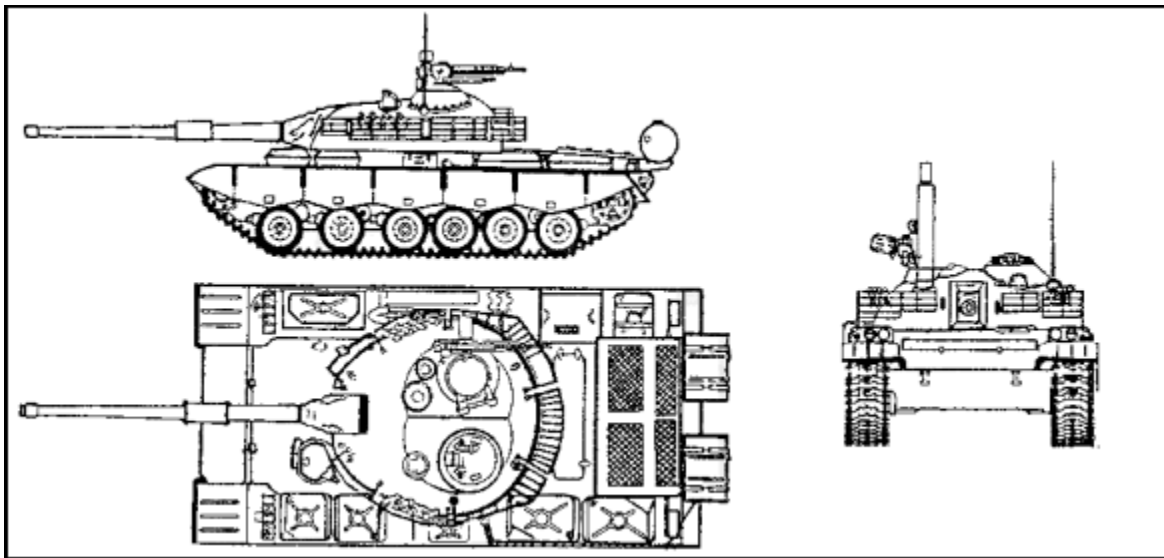


Figure 1-9. Type 80 Main Battle Tank.

1. Type 80 Main Battle Tank (China) (Figure 1-9). The Type 80 is a brand new chassis with a turret similar to that installed on the Type 69 MBT but with different armament.

(1) Variants. The following variants summarize some of the Type 80s key distinguishing features:

(a) Type 80-II. The Type 80-II is virtually identical to the basic Type 80 except that it has a slightly greater combat weight and a greater overall length. Other specifications are internal and will not be discussed in this lesson.

(b) Type 85-II and Type 85-IIA. These two vehicles have been developed with a welded turret that can be fitted with additional armor protection. Exact differences between the Type 85 and Type 85-II are unknown; although the Type 85-II is slightly heavier and shorter in length. Armament is the same as in the Type 80 except that the Type 85-II can carry 46 rounds of 105-mm ammunition while the Type 85-IIA can carry 44 rounds. Other differences are internal and will not be discussed further.

(2) Recognition Features. The Type 80 has

- six dual rubber-tired road wheels on each side with the drive sprocket at the rear, idler at the front and three track return rollers. The first, second, fifth and sixth road wheel stations have hydraulic shock absorbers.
- two optional drum-type fuel tanks that can be mounted on the rear for an increased operational range.
- a snorkel for deep fording mounted on the loaders hatch when in use.
- a commander's cupola with a forward-opening hatch cover with two integral periscopes for side observation.
- three frontal observation periscopes mounted forward of the commanders hatch.
- a loader's left opening circular hatch cover.
- four forward-firing electrically-operated smoke dischargers on each side and a stowage basket that runs around the sides and rear of the turret.
- a splash board mounted on the glacis plate.
- a driver's single left opening hatch cover, in front of which are two day periscopes, one of which can be replaced by an infrared periscope for night driving.
- two circular exhaust outlets on the right side of the hull.
- armored track skirt plates with hinged wavy bottoms to allow for suspension maintenance.

(3) Vehicle Characteristics. The Type 80 all-welded hull is divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The Type 80 has a four-man crew. The tank commander, gunner and loader sit in the turret with the commander on the left, gunner forward and below the commander, and the loader on the right. Composite armor can also be added to the vehicle's front and turret for increased protection. Additionally, the Type 80 has smoke laying capabilities. Specifications that apply to the Type 80 are provided in the lists and paragraphs that follow.

Type 80 Measurements

Combat weight, 38,000 kg.

Hull length, 6.325 meters.

Hull width over tracks, 3.354 meters.

Hull width over skirts, 3.372 meters.

Height to turret roof, 2.290 meters.

Ground clearance, 0.48 meters.

Track, 2.7 meters.

Track length on ground, 4.064 meters.

Fuel capacity, 1,400 liters.

Maximum road range, 430 km.

Maximum road speed, 55-60 km/h.

- (4) Vehicle Capabilities. The Type 80 can

- cross a 2.7-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford 1.4 meters without snorkel.
- ford 5 meters with preparation.

(5) Armament Characteristics. The Type 80 has two layers of armament: main and secondary.

(a) Main Armament. Main armament for the Type 80 is a 105-mm rifled gun fitted with a fume extractor and a thermal sleeve. The ammunition load for the 105-mm gun is 44 rounds.

(b) Secondary Armament. The Type 80s secondary armament consists of a 12.7-mm anti-aircraft machine gun mounted on the loader's hatch and a 7.62-mm machine gun mounted coaxially to the main armament.

(6) Countries Served. Chinese development of the Type 80 MBT is complete and the vehicle is ready for production.

## 2. Light Tank (LT) (China).

Type-62. The Type 62 LT is virtually a scaled down Type 59 MBT ([Figure 1-7](#)) and is believed to be used in place of the Type 59 in rugged terrain such as that encountered in southern China. The Type-62 LT is the only threat light tank discussed in this subcourse.

a. Variants. None.

b. Recognition Features. The Type 62 light tank has the same basic recognition features as the Type 59.

c. Vehicle Characteristics. The layout of the Type 62 is identical to the Type 59. It has a four-man crew with the driver at the front of the hull on the left and the other three crew members in the turret. The commander and gunner are seated on the left of the turret with the loader on the right. The engine and transmission are at the rear of the hull. Specifications that apply to the Type 62 are provided in the lists and paragraphs that follow.

### Type 62 Measurements

Combat weight, 21,000 kg.

Hull length, 5.55 meters.

Hull width, 2.86 meters.

Height, 2.25 meters.

Ground clearance, 0.42 meters.

Track, 2.39 meters.

Track width, 380 mm.

Track length on ground, 3.53 meters.

Fuel capacity, 730 liters.

Maximum road range, 500 km.

Maximum road speed, 60 km/h.



- d. Vehicle Capabilities. The Type 62 can

- cross a 2.55-meter trench.
- mount a 0.7-meter vertical step.
- climb a 60-percent grade.
- ford 1.3 meters without snorkel.

- e. Armament Characteristics. The Type 62 has two layers of armament: main and secondary.

(1) Main Armament. Main armament is a 85-mm gun, probably identical to that on the Type 63 light amphibious tank. Main ammunition load for this weapon is 47 rounds.

(2) Secondary Armament. Secondary armament consists of a 12.7-mm anti-aircraft Type 54 heavy machine gun mounted at the loader's position for anti-aircraft use and a 7.62-mm machine gun mounted coaxially to the right of the main armament. Another 7.62-mm machine gun is mounted at the bow.

- f. Countries Served. Type 62 tanks are in service with the following countries:

Albania  
China

Congo  
North Korea

Mali  
Sudan

Tanzania  
Zaire

### 3. Light Amphibious Tank LAT (China).

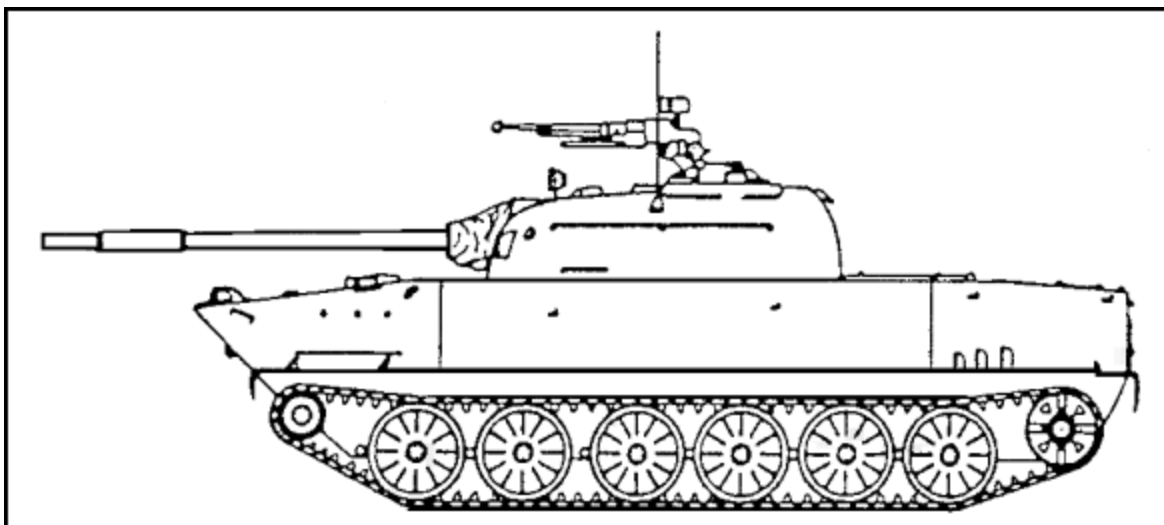


Figure 1-10. Type 63 Light Amphibious Tank (China).

Type 63 LAT (Figure 1-10). This is a redesigned version of the Type 60. The Type 63 LAT uses automotive components of the Type 77 series APC, which is the Chinese version of the Soviet BTR50KP vehicle, both of which are discussed in Lesson Two.

- a. Variants. None.

- b. Recognition Features. The Type 63 LAT has

- a fully amphibious capability.

- six rubber-tired road wheels with the drive sprocket at the rear, idler at the front and no track return rollers.
- a shallow glacis plate.
- a trim board folded back onto the glacis plate that is erected at the front of the hull before entering the water.
- a single-piece driver's hatch cover that has three periscopes mounted forward of the hatch.
- a infrared driving light on the right side of the hull front.
- a commander's hatch that opens forward and a loader's hatch that opens to the rear.
- a dome-shaped ventilator mounted in the turret roof to the rear of the commander's and gunner's hatches.
- optional fuel tanks that can be fitted on top of the hull to increase operational range.
- a Chinese designed laser rangefinder (fitted on some models) over the rear part of the 85-mm gun. This is identical to the laser rangefinder found on some Chinese Type 59 MBTs.
- no NBC system or night vision equipment for commander and gunner.

c. Vehicle Characteristics. The Type 63 LAT has an all-welded rolled-steel hull divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The turret is in cast-steel sections welded together. The Type 63 has a four-man crew consisting of the tank commander, driver, gunner and loader. The tank commander sits on the left side of the turret with the gunner on the same side in front and the loader to the right. The Type 63 is fully amphibious, being propelled in the water by two water jets of Soviet design. Specifications that apply to the Type 63 are provided in the lists and paragraphs that follow.

#### Type 63 Measurements

<u>Combat weight</u> , 18,000 kg.	<u>Ground clearance</u> , 0.4 meters.
<u>Hull length</u> , 7.15 meters.	<u>Track</u> , 2.82 meters.
<u>Hull width</u> , 3.2 meters.	<u>Track length on ground</u> , 4.44 meters.
<u>Height to turret top</u> , no AAMG, 2.522 meters.	<u>Fuel capacity</u> , 545 liters.
<u>Height to turret top</u> , with AAMG, 3.122 meters.	<u>Maximum road range</u> , 370 km.
	<u>Maximum road speed</u> , 64 km/h.
	<u>Maximum water speed</u> , 12 km/h.

#### Type 63 Hull Armor

<u>Front</u> , 11 mm.	<u>Floor</u> , 10 mm.
<u>Sides upper</u> , 14 mm.	<u>Rear</u> , 10 mm.
<u>Top</u> , 10 mm.	<u>Mantlet</u> , 11 mm.

- d. Vehicle Capabilities. The Type 63 can

- cross a 2.9-meter trench.
- mount a 0.87-meter vertical step.
- climb a 60-percent grade.
- ford amphibiously.

- e. Armament Characteristics. The Type 63 has two layers of armament: main and secondary.

(1) Main Armament. The Type 63 has a 85-mm gun, probably identical to that installed in the Type 62 light tank. A normal ammunition load for the main armament is 47 rounds.

(2) Secondary Armament. Secondary armament consists of a 12.7-mm anti-aircraft machine gun, a 7.62-mm Type 54 (Soviet M1938/46 DShKM) heavy machine gun mounted at the loader's station for anti-aircraft defense and another 7.62-mm machine gun mounted coaxially to the main armament.

- f. Countries Served. Type 63 LATs are in service with the following countries:

China  
North Korea

Pakistan

Sudan

Vietnam

## LESSON ONE

### PRACTICE EXERCISE

**INSTRUCTIONS:** The following items will test your grasp of the material in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study that part of the lesson again before continuing. Answer the following questions. Choose the BEST answer for each question, and select the corresponding letter.

**General Situation:** You are an infantry officer stationed in the Middle East. As an infantry officer it is vital that you recognize and know some of the capabilities of the various THREAT heavy armored vehicles that Soviet, Warsaw Pact, and Middle East forces could deploy against you. Use this situation to answer the questions in this practice exercise.

1. You are conducting spotting operations along the border of a Warsaw Pact country who is engaged in training exercises. You observe a number of vehicles of the same type with large turrets and bow-mounted machine guns. You identify the vehicles (shown in [Figure 1-11](#)) as
  - ☐ A. T-54/T-55 MBTs.
  - ☐ B. T-62 MBTs.
  - ☐ C. T-34/85 MBTs.
  - ☐ D. T-64 MBTs.

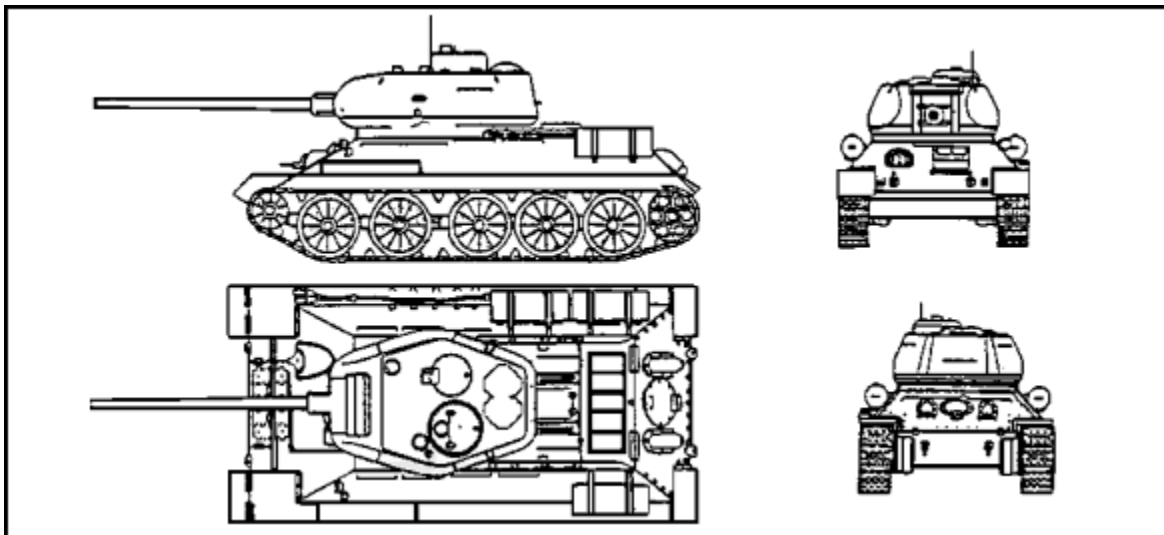


Figure 1-11.

2. The vehicle in [Figure 1-11](#) carries two layers of armament consisting of a
- A. 85-mm main gun, a 12.7-mm AA MG, and a 7.62-mm MG.
  - B. 12.7-mm main weapon and a 7.62-mm secondary gun.
  - C. 85-mm main gun and two 7.62-mm secondary weapons.
  - D. 100-mm main gun and one 12.7-mm secondary weapon.
3. With snorkel installed, the vehicle shown in [Figure 1-11](#) can ford a maximum of
- A. 6.0 meters.
  - B. 4.3 meters.
  - C. 5.0 meters.
  - D. 5.5 meters.
4. While you are on field maneuvers in the Middle East, one of your men points out an Iraqi vehicle across the border. Using your binoculars, you notice that in addition to its armament, the vehicle has two snorkels mounted at the rear. You identify the vehicle (shown in [Figure 1-12](#)) as a
- A. Basic made T-54 MBT.
  - B. Basic made T-62 MBT.
  - C. Basic made T-64 MBT.
  - D. Basic made T-72 MBT.

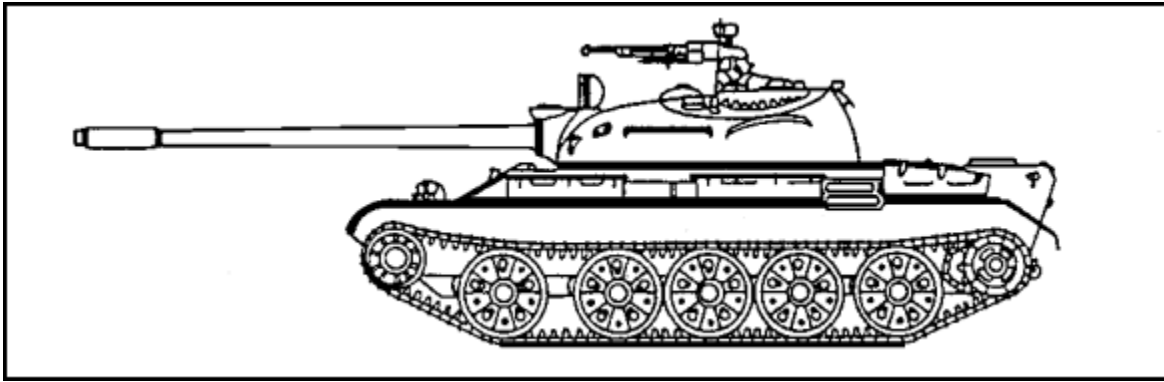


Figure 1-12.

5. Refer to [Figure 1-12](#). Two other main features or characteristics of the vehicle that most enabled you to correctly identify it was the
  - A. 100-mm main gun and 12.7-mm anti-aircraft gun.
  - B. three tanks mounted on the left running board.
  - C. 85-mm main gun and 7.62-mm secondary weapon.
  - D. five evenly-spaced road wheels.
6. The vehicle shown in [Figure 1-12](#) arrives at the edge of a small lake. You know the water is a maximum of 4-meters deep. The vehicle
  - A. can ford amphibiously.
  - B. cannot ford under any circumstance.
  - C. must wait for a bridging unit.
  - D. can ford safely.
7. You are on a reconnaissance mission in a Middle Eastern desert and spot a vehicle (shown in [Figure 1-13](#)) with a distinct spacing between the third and fourth and fourth and fifth road wheel. You also observe what appears to be a 115 mm turret-mounted main gun. You identify the vehicle as a
  - A. Type 59 MBT.
  - B. T-72 MBT.
  - C. T-80 MBT.
  - D. T-62 MBT.

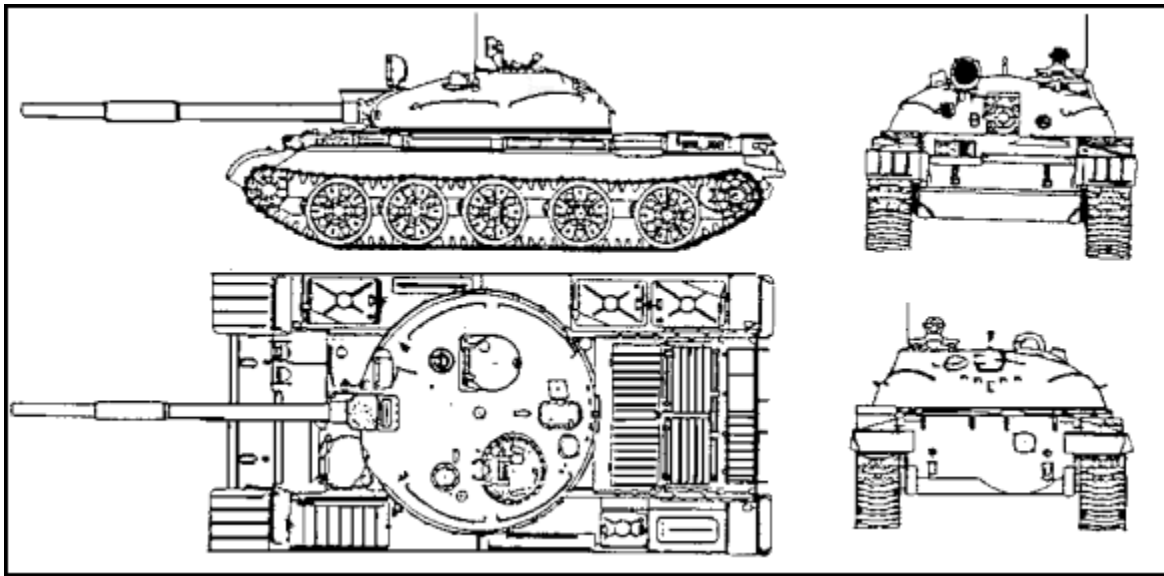


Figure 1-13.

8. Refer to [Figure 1-13](#). Other recognition features of the vehicle that most enabled you to correctly identify it was its
- A. smoke discharges and secondary armament.
  - B. four tanks: three on the right and one on the left.
  - C. large infrared searchlight left of the main armament.
  - D. squared front and rear hull.
9. Refer to [Figure 1-13](#). You are directing a construction unit to dig an anti-tank ditch to prevent the vehicle type shown in [Figure 1-13](#) from crossing into your holding zone. Knowing the capabilities of the vehicle, you instruct the team to dig a deep trench with straight vertical walls and a minimum width of
- A. 1.5-meters.
  - B. 3.5-meters.
  - C. 2.5-meters.
  - D. 2.0-meters.

## Lesson 2

### THREAT LIGHT ARMORED VEHICLES IDENTIFICATION and CAPABILITIES

#### OVERVIEW

##### LESSON DESCRIPTION:

In this lesson, you will learn to identify various threat light armored vehicles and their capabilities.

##### TERMINAL LEARNING OBJECTIVE:

ACTION:	Identify threat light armored vehicles, and their capabilities.
CONDITIONS:	You will be given information from FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.
STANDARDS:	Recognize and identify threat light armored vehicles and their capabilities in accordance with FM 100-2-3 (CD), Jane's Armour and Artillery 1989-1990, and the Soviet and Warsaw Pact Equipment Handbook, Revision 1.
REFERENCES:	The material contained in this lesson was derived from the following publications:  FM 100-2-3 Jane's Armour and Artillery 1989-1990 Soviet and Warsaw Pact Equipment Handbook, Revision 1.

#### INTRODUCTION

The various threat light armored vehicles have distinctive characteristics, and capabilities. This lesson will discuss the identification characteristics, and capabilities of threat light armored vehicles.

##### THREAT LIGHT ARMORED VEHICLES AND THEIR CAPABILITIES

Threat light armored vehicles are categorized as armored command reconnaissance vehicles (ACRVs), airborne combat vehicles (ACVs), armored personnel carriers (APCs and WAPCs), armored reconnaissance vehicles (ARVs), amphibious scout cars (ASCs), infantry combat vehicles (ICVs), infantry fighting vehicles (IFVs), mountaineers combat vehicles (MCVs), mechanized infantry combat vehicles (MICVs), multipurpose tracked vehicles (MTVs), Tank Destroyers (TDs), and battlefield surveillance radars.



1. Armored Command Reconnaissance Vehicle (ACRV).

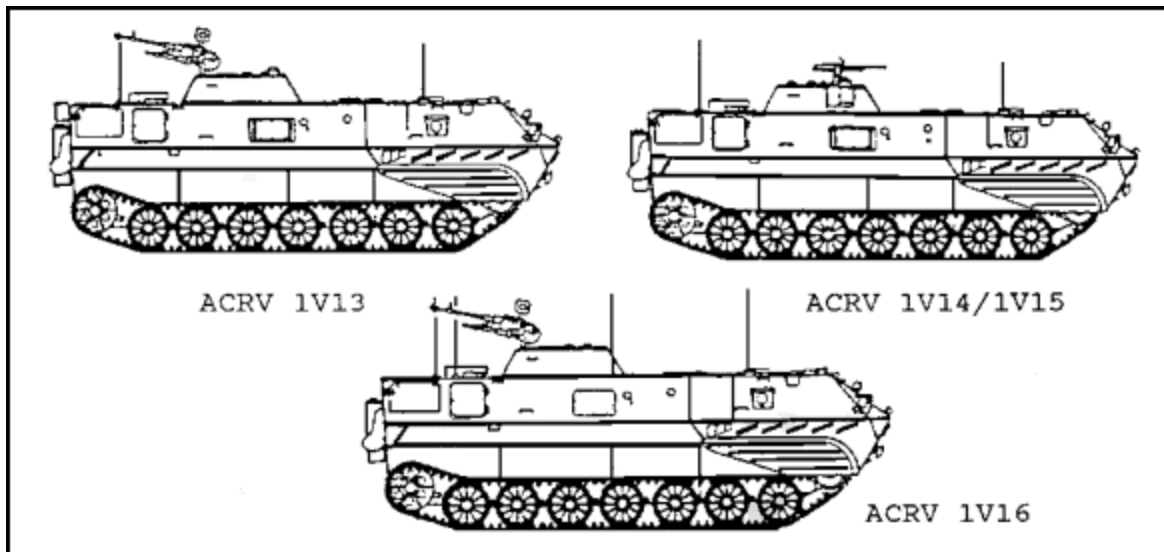


Figure 2-1. Armored Command and Reconnaissance Vehicle (ACRV).

1V12 ACRV. 1V12 is the overall designation of four armored command reconnaissance vehicles: 1V13 ([Figure 2-1](#)), 1V14, 1V15, and 1V16. All four use the MT-LB chassis.

a. Variants.

(1) ACRV 1V13. The 1V13 has a 12.7-mm DShK anti-aircraft machine gun mounted atop the turret and a rectangular box projecting from the hull just below the turret. The ACRV 1V13 remains in the battery firing position as the battery fire direction center (FDC) relaying firing data to the SP howitzers.

(2) ACRV 1V14/1V15. The turrets on these two versions are fitted with a laser rangefinder, optical observation devices and associated fire-control equipment. They also have a rectangular box projecting from the hull just below the turret. The ACRV 1V14 and 1V15 serve as battery and battalion commanders' COPs, respectively, and do not remain in the firing position.

(3) ACRV 1V16. The 1V16 may be fitted with a 12.7-mm machine gun while eliminating the rectangular box that projects from the hull just below the turret on the other three versions. The ACRV 1V16 functions as the battalion FDC.

b. Recognition Features. The 1V12s have

- seven road wheels with no return rollers.
- high, box-like hulls and a steep glacis at the front.
- flat, round turrets on the rear half.
- straight vertical rear hulls with a single exit door.
- three or four antennas on the top of the hull.

c. Vehicle Characteristics. The 1V12s are deployed in self-propelled (SP) howitzer battalions as fire direction centers (FDCs) and collocate with the maneuver unit commander. The 1V12s high degree of mobility, allows SP howitzers to operate closer to the forward line of troops. The 1V12s communications and fire direction equipment are mainly concerned with identifying targets of opportunity. Specifications that apply to the 1V12 are provided in the lists and paragraphs that follow.

#### ACRV 1V12 Measurements

<u>Crew</u> , 5.	<u>Ground clearance</u> , 395 to 414 mm.
<u>Weight</u> , 11,000 kg.	<u>Fuel capacity</u> , 450 liters.
<u>Length without gun</u> , 7.06 meters.	<u>Road range</u> , 500 km.
<u>Width overall</u> , 2.81 meters.	<u>Maximum road speed</u> , 60 km/h.
<u>Height overall</u> , 2.43 meters.	<u>Maximum water speed</u> , 6 km/h.

#### ACRV 1V12 Armor

<u>Hull</u>	<u>Turret</u>
15 mm	20 mm.

d. Vehicle Capabilities. The ACRV 1V12 can

- cross a 2.70-meter trench.
- mount a 0.70-meter vertical step.
- climb a 35-percent grade.
- ford amphibiously.

e. Armament Characteristics. The 12.7-mm machine guns on the 1V13 and 1V16 have a maximum rate of fire of 540 to 600 rds/min.

f. Countries Served. 1V12s are in service with the Soviet Union.

## 2. Airborne Combat Vehicle (ACV).

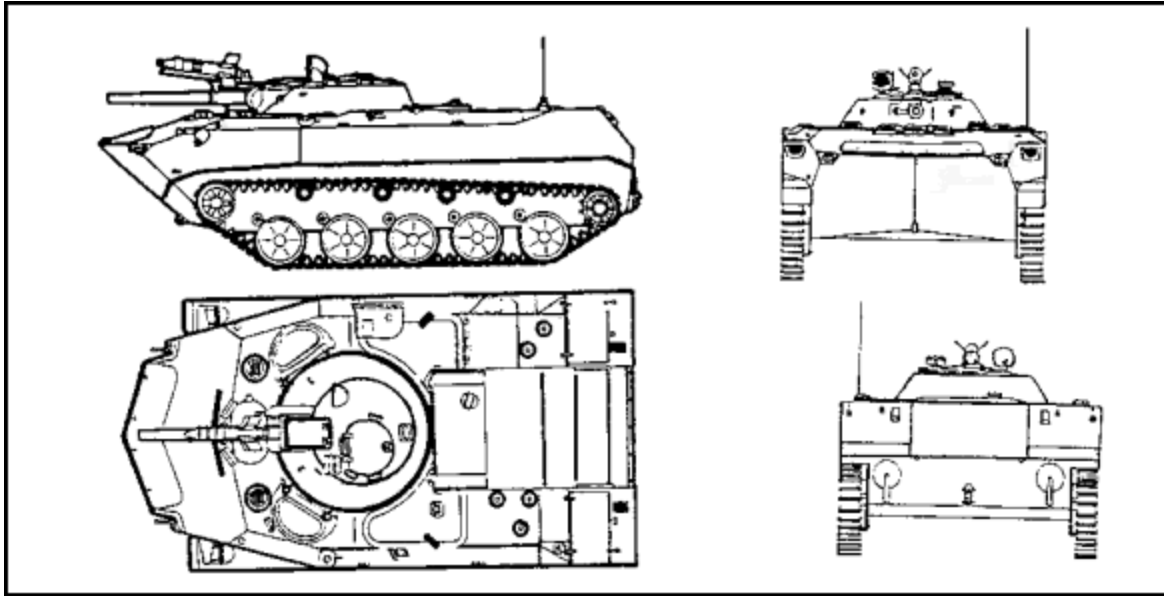


Figure 2-2. BMD--Airborne Combat Vehicle (ACV).

BMD (Basic Version) ([Figure 2-2](#)). Since 1973, the BMD has replaced the airborne assault gun ASU-57 in the Soviet airborne forces, substantially increasing the firepower and maneuverability of the airborne division. Originally thought to be a light tank, the BMD may more properly be considered the airborne equivalent of the BMP infantry combat vehicle. Although, it superficially resembles the BMP, it is considerably smaller and except for the turret and main armament, is an entirely new design. Excluding the ASU-57, the BMD is the lightest tracked combat vehicle in the Soviet Army. The BMD is used in Soviet airborne divisions as an infantry combat vehicle

a. Variants. A number of BMD variants are presented in the following paragraphs:

(1) BMD-2(M-1979/1). This is a multi-purpose armored transporter, which may be used as a personnel carrier, a prime mover for support weapons, a maintenance support vehicle, or a security or route-control vehicle. It has the addition of one road wheel and one support roller per side. The BMD turret and its integral armaments have been removed and replaced by a low, flat superstructure. There are at least two firing ports per side and the bow machine guns have been retained.

(2) BMD-2KSh9(M-1979/3). This is a command vehicle that is fitted with folding clothes rail antenna masts.

(3) BMD M-1981/1. This version has a chassis from the basic version and a two-man turret mounting the same armament as the BMP-2, a 30-mm automatic cannon. It probably also mounts AT4/SPIGOT or AT-5/SPANDREL ATGMs.

(4) BMD M-1981 2S9/120-mm Self-propelled Howitzer.

(5) BMD 82-mm Mortar Carrier. This version is used only in Afghanistan.

- b. Recognition Features. The BMD has
  - five road wheels and four return rollers (BMD-1).
  - six road wheels and four return rollers (BMD-2).
  - no rear exit doors.
  - a BMP-type turret set forward on the hull.
  - a driver's hatch and vision blocks centered below the main gun.
  - an additional hatch on each side of the driver.
  - a troop compartment that has an overhead armor cover and only one firing port on each side and one in the rear for personnel weapons firing.
  - a boat-shaped hull with smooth front deck and flat rear deck.
  - two waterjets in the rear.
  - a prominent cut-away in the rear deck housing.
  - a rear-mounted engine.
  - a hydropneumatic suspension with variable height capability.
- c. Vehicle Characteristics. Characteristics and specifications that apply to the BMD are presented in the lists and paragraphs that follow.

#### BMD Measurements

<u>Crew</u> , 3	<u>Ground clearance</u> , 0.1 to 0.45 meters.
<u>Passengers</u> , 4	<u>Maximum road speed</u> , 80 km/h.
<u>Combat weight</u> , 7.5 metric tons.	<u>Maximum water speed</u> , 10 km/h.
<u>Length</u> , 5.41 meters.	<u>Fuel capacity</u> , 300 liters.
<u>Width</u> , 2.53 meters.	<u>Maximum road range</u> , 320 km
<u>Height</u> , 100-450mm.	

#### BMD Armor

<u>Hull</u>	<u>Turret</u>
15 mm	23 mm.

- d. Vehicle capabilities. The BMD can

- cross a 1.60-meter trench.
- mount a 0.80-meter vertical step.
- climb a 32-percent grade.
- ford amphibiously.

- e. Armament Characteristics. The BMD has three layers of armament: main, secondary and supplemental.

(1) Main Armament. The BMDs main armament consists of one turret-mounted smoothbore 73-mm cannon and one turret-mounted 30-mm automatic cannon. The rate of fire in rds/min for the 73mm cannon is eight and for the 30-mm cannon is 350 to 550.

(2) Secondary Armament. The BMDs secondary armament consists of one 7.62-mm PKT coaxially-mounted machine gun. Two bow mounted machine guns are fitted on model M-1979/1. The practical rate of fire for these weapons is 250 rds/min with a basic load of 2,000 to 3,000 rounds.

(3) Supplemental. The BMDs supplemental armament consists of two ATGM missiles, a model AT-3 SAGGER and a AT-5 SPANDREL, both of which fire HEAT type warheads. The AT-3 is launched by rails and the AT-5 is launched by tubes. The ammunition load for the AT-3 is four missiles. The ammunition load for the AT-5 is not available.

f. Country Served. The BMD is in service with the Soviet Union.

### 3. Armored Personnel Carriers (APCs).

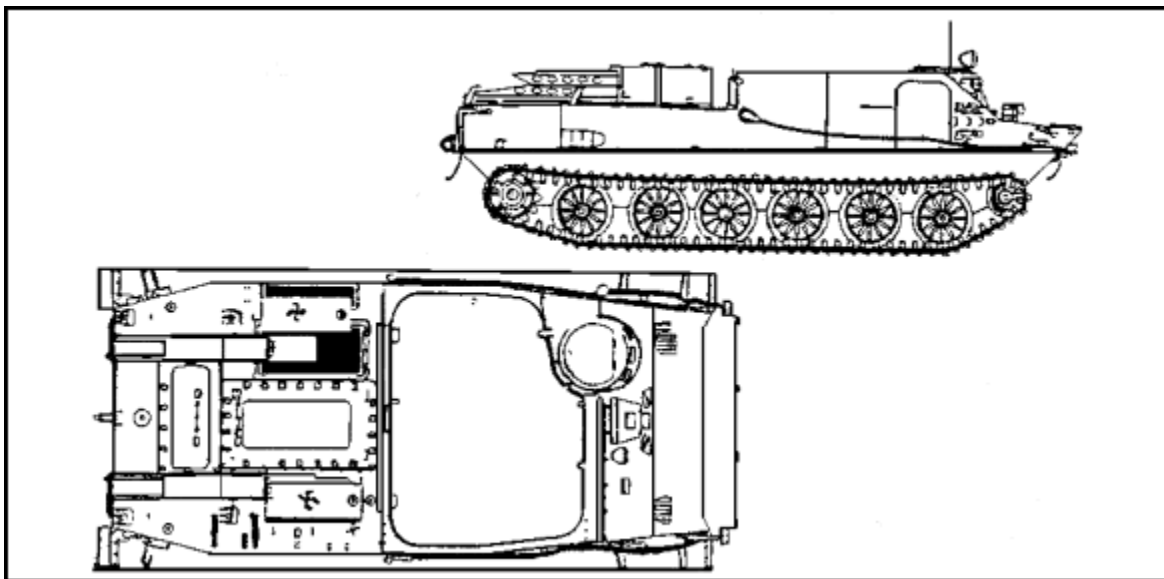


Figure 2-3. BTR-50P (APC).

a. BTR-50P ([Figure 2-3](#)). The BTR-50P is the basic APC version with an open troop compartment.

(1) Variants. A number of BTR-50 variants are presented in the following subparagraphs:

(a) BTR-50PA. This version has a 14.5-mm KPVT open-mounted heavy machine gun with a practical rate of fire of 150 rds/min and a load of 500 rounds. This BTR has no loading ramps.

(b) BTR-50PK. The BTR-50PK has a 12.7-mm DShK 38/46 open-mounted machine gun with a practical rate of fire of 80 to 100 rds/min and a load of 750

rounds. It also has overhead armor for the troop compartment and an NBC protection system.

(c) BTR-50PU Model 2. This is the BTR command version.

(d) MTP Technical Support Vehicle. This version has a raised workshop compartment.

(e) MTK aka UR-67. This is a mine-clearing version.

(2) Recognition Features. The BTR-50P has

- six road wheels and no return rollers.
- a boat-type hull with vertical sides.
- a lowered rear deck.
- two waterjets and covers at the rear.
- a tower-type cupola on the left front.
- a drivers hatch in the front center.
- the same chassis as the PT-76.

(3) Vehicle Characteristics. Specifications that apply to the BTR-50P are provided in the lists and paragraphs that follow.

#### BTR-50P Measurements

Crew, 2.

Passengers, 20.

Combat weight, 14.2 metric tons.

Length, 7.32 meters.

Width, 3.14 meters.

Height, 1.85 meters.

Ground clearance, 0.33 meters.

Maximum road speed, 45 km/h.

Maximum water speed, 10 km/h.

Fuel capacity, 400 liters.

Maximum road range, 240 km.

#### BTR-50P Armor

Hull  
10 mm.

Turret  
N/A.

(4) Vehicle Capabilities. The BTR-50P can

- cross a 2.80-meter trench.
- mount a 1.10-meter vertical step.
- climb a 38-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The BTR-50P has one layer of armament: a 12.7-mm open-mounted machine gun with a practical rate of fire of 80 to 100 rds/min and a load of 750 rounds.

(6) Country Served. The BTR-50P is in service with the following countries.

Afghanistan	Czechoslovakia	Israel	Sudan
Albania	Egypt	Libya	Syria
Algeria	Finland	Morocco	Soviet Union
Angola	Germany, (East)	North Korea	Vietnam
Bulgaria	India	Poland	Yugoslavia
Congo	Iran	Romania	
Cyprus	Iraq	Somalia	

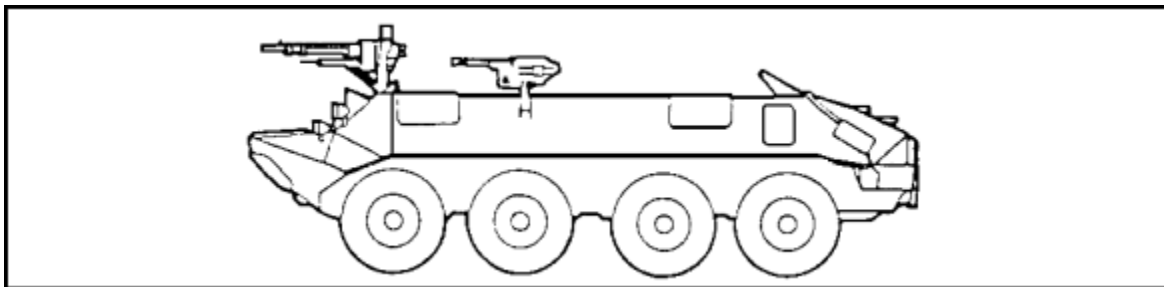


Figure 2-4. BTR-60P (Soviet).

b. BTR-60P (Soviet) ([Figure 2-4](#)). The BTR-60P and its variants are normally used by the Soviet Motorized Rifle Divisions. In recent years, however, a number of Motorized Rifle Divisions have had their BTR-60Ps replaced by the better armed BMP-1 ICVs. The BTR-60P is used by the Soviet Naval Infantry as its standard APC. It is not used by Czechoslovakian or Polish motor rifle units, though Czechoslovakia may use specialized versions of the BTR-60.

(1) Variants. The following variants summarize some of the key distinguishing features:

(a) BTR-60P Maintenance Assistance. These BTR-60Ps have been converted for maintenance roles and have a raised tarpaulin covering the troop compartment.

(b) BTR-60PA. This version has overhead armor protection for the troop compartment. The commander's and driver's positions are identical to those on the original BTR-60P except that the driver has a roof-mounted periscope and both have a single-piece hatch cover that opens to the rear.

Behind the commander's and driver's hatches is a single rear-opening rectangular hatch, in front of which is mounted a 7.62-mm SGMB or PKB machine gun. Many of these vehicles also have a 7.62-mm machine gun mounted on each side of this hatch cover.

A right-opening hatch cover is provided in the roof of the personnel compartment towards the rear on the right side. Three firing ports are provided on each side of the hull. No entry doors are provided on the hull sides.

A command version of the BTR-60PA is also in service with a roofmounted generator, 10-meter high radio antenna and a rail antenna running along the front, left side and rear of the hull.

(c) BTR-60PB. This version of the BTR-60P will be covered later in this lesson.

(d) BTR-60PU Command Vehicle. This is a BTR-60P fitted with bows, a tarpaulin cover and internal seats for the command staff, mapboards and additional communications equipment.

(e) BTR-60-60PU-12 Command Vehicle. This version is essentially a BTR-60PA with a large stowage box on the right side rear hull. A box, which may house a generator to power the additional communications equipment, is mounted on the roof. To the immediate rear of the commander's roof hatch is a telescopic mast. The BTR-60PU-12 operates with air defense units.

(f) BTR-60MS Radio Vehicle. This BTR is equipped with a radio and a telescopic antenna.

(g) BTR-60 Twin 30-mm SPAAG. This is a Cuban Army version that uses a Czechoslovakian twin 30-mm towed antiaircraft gun system mounted in an open mount on top of the vehicle.

(2) Recognition Features. The BTR-60P has

- a torsion bar suspension with the first and second road wheels on each side provided with two hydraulic shock absorbers. The third and fourth road wheels are provided with a single hydraulic shock absorber.
- a vision block to the left of the driver and right of the commander.
- a windscreen to the front of the driver and commander that is covered by a hinged flap during action.
- an infrared searchlight above the windscreen.
- two half doors and three firing ports in each side of the hull. The firing ports fire forward only, not to the side.
- a two-part circular plate that covers the water jet exit when the water jet is not in use.
- a trim vane that is erected at the front of the hull before the vehicle enters the water. The trim vane is stowed flat under the nose of the vehicle when not required.
- a front-mounted winch.
- foot steps between the wheels.



(3) Vehicle Characteristics. The BTR-60P is a fully amphibious vehicle that is propelled through the water by a water jet mounted at the rear of the hull. The vehicle has an allwelded hull with the driver and commander seated at the front and an open-topped personnel compartment behind them. The engine compartment is at the rear. The driver sits on the left with the vehicle commander to his right. Specifications for the BTR-60P is provided in the lists and paragraphs that follow.

#### BTR-60P Measurements

<u>Crew</u> , 2.	<u>Height to hull top</u> , 2.055 meters.
<u>Normal passenger load</u> , 12.	<u>Ground clearance</u> , 0.475 meters.
<u>Maximum passenger load</u> , 16.	<u>Track</u> , 2.37 meters.
<u>Configuration</u> , 8 x 8.	<u>Maximum road speed</u> , 80 km/h.
<u>Combat weight</u> , 9980 kg.	<u>Maximum water speed</u> , 10 km/h.
<u>Length</u> , 7.56 meters.	<u>Fuel capacity</u> , 290 liters.
<u>Width</u> , 2.825 meters.	<u>Maximum road range</u> , 500 km.
<u>Height to turret top</u> , N/A.	

#### BTR-60P Armor

<u>Hull front upper</u> , 7 mm.	<u>Hull belly front</u> , 5 mm.
<u>Hull front lower</u> , 9 mm.	<u>Hull belly rear</u> , 5 mm.
<u>Hull side upper</u> , 7 mm.	<u>Turret front</u> , N/A.
<u>Hull side lower</u> , 7 mm.	<u>Turret sides</u> , N/A.
<u>Hull rear upper</u> , 5 mm.	<u>Turret rear</u> , N/A.
<u>Hull rear lower</u> , 7 mm.	<u>Turret top</u> , N/A.
<u>Hull top</u> , 7 mm.	

(4) Vehicle Capabilities. The BTR-60P can

- cross a 2.0-meter trench.
- mount a 0.4-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The BTR-60P has two layers of armament: main and secondary.

(a) Main Armament. The BTR-60P has a 7.62-mm SGMB or PKB machine gun mounted forward on the hull. Some vehicles have the heavier 12.7-mm DShKM machine gun at this position.

(b) Secondary Armament. Mounts for 7.62-mm machine guns are fitted on each side of the BTR-60P's hull.

(6) Countries Served. The BTR-60P is in service with the following countries.

Afghanistan	Ethiopia	Kampuchea	Somalia
Algeria	Finland	Korea, North	Syria
Angola	Germany, (East)	Libya	Soviet Union
Botswana	Guinea	Mali	Vietnam
Bulgaria	Guinea-Bissau	Mongolia	Yemen, North
China	India	Mozambique	Yemen, South
Congo	Iran	Nicaragua	Yugoslavia
Cuba	Iraq	Romania	Zambia
Djibouti			

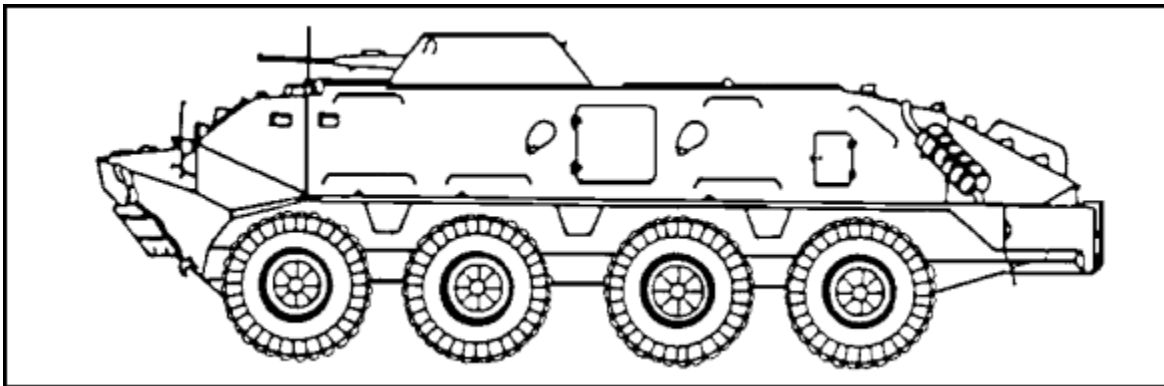


Figure 2-5. Soviet BTR-60PB APC.

c. BTR-60PB (Soviet) ([Figure 2-5](#)). The BTR-60PB is a variant of the BTR-60P and is essentially the BTR-60PA fitted with a machine gun turret and other modifications.

(1) Variants.

(a) BTR-60PB Forward Air Control Vehicle. This version is essentially the BTR-60PB with the armament removed. The resulting turret port is covered by a plexiglass observation window. A generator is also mounted on the top of the hull at the rear to power additional communications equipment.

(b) Artillery Command and Observation Post Vehicle. This version is used by the (East) German Army.

(2) Recognition Features. The BTR-60PB has

- roof-mounted periscopes for observation to the front and sides of the vehicle in place of the vision blocks immediately in front of the commander and driver.
- a turret that is identical to that fitted to the Soviet BRDM-2 amphibious scout car (ASC) and the Czechoslovakian OT-64 armored personnel carrier (APC), discussed in a later section.
- a single-piece left-opening hatch cover to the rear of the turret on the right side. To the left rear of this is a single-piece hatch cover that opens to the right.

- a single door that opens forwards and two or three firing ports, that only fire forward 60 degrees, and vision blocks in each side of the hull.
- high hull mounted exhausts mounted on both sides. o a large hydro-jet cover mounted at the rear.
- horizontal climbing handles on the sides.
- foot steps between the wheels on both sides.
- a fording plate mounted below the bow.
- a covered troop compartment.
- two square hatches on the top rear.
- well-sloped armor.

Late production BTR-60PBs have the same sighting improvement as the BTR-70 (discussed in the following section), which consists of a small additional periscopic sight on the turret roof,

(3) Vehicle Characteristics. The BTR-60PB is a fully amphibious vehicle that is propelled through the water by a water jet mounted at the rear of the hull. The vehicle has an allwelded hull with the driver and commander seated at the front, personnel compartment behind them and the engine compartment at the rear. The driver sits on the left with the vehicle commander to his right. The BTR-60PB has a filtration and overpressurization system for NBC protection. Specifications for the BTR-PB are provided in the lists and paragraphs that follow.

#### BTR-60PB Measurements

<u>Crew</u> , 3.	<u>Height to hull top</u> , 2.055 meters.
<u>Normal passenger load</u> , 6.	<u>Ground clearance</u> , 0.475 meters.
<u>Maximum passenger load</u> , 8.	<u>Track</u> , 2.37 meters.
<u>Configuration</u> , 8 x 8.	<u>Maximum road speed</u> , 80 km/h.
<u>Combat weight</u> , 10,300 kg.	<u>Maximum water speed</u> , 10 km/h.
<u>Length</u> , 7.56 meters.	<u>Fuel capacity</u> , 290 liters.
<u>Width</u> , 2.825 meters.	<u>Maximum road range</u> , 500 km.
<u>Height to turret top</u> , 2.31 meters.	

#### BTR-60PB Armor

<u>Hull front upper</u> , 7 mm.	<u>Hull belly front</u> , 5 mm.
<u>Hull front lower</u> , 9 mm.	<u>Hull belly rear</u> , 5 mm.
<u>Hull side upper</u> , 7 mm.	<u>Turret front</u> , 7 mm.
<u>Hull side lower</u> , 7 mm.	<u>Turret sides</u> , 7 mm.
<u>Hull rear upper</u> , 5 mm.	<u>Turret rear</u> , 7 mm.
<u>Hull rear lower</u> , 7 mm.	<u>Turret top</u> , 7 mm.
<u>Hull top</u> , 7 mm.	

• (4) Vehicle Capabilities. The BTR-60PB can

- cross a 2.0-meter trench.
- mount a 0.4-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The BTR-60PB has two layers of armament: main and secondary.

(a) Main Armament. BTR-60PB main armament is a 14.5-mm KPVT heavy machine gun mounted in the forward part of the vehicle. The practical rate of fire for this weapon is 150 rds/min with a basic load of 500 rounds.

(b) Secondary Armament. Secondary armament on the BTR-60PB is a 7.62-mm PKT machine gun mounted coaxially to the right with the telescopic sight mounted coaxially to the left. A practical rate of fire for the 7.62-mm gun is 250 rds/min with a basic load of 2,000 rounds.

(6) Countries Served. The BTR-60PB is in service with the following countries.

Afghanistan	Ethiopia	Kampuchea	Somalia
Algeria	Finland	Korea, North	Syria
Angola	Germany, (East)	Libya	Soviet Union
Botswana	Guinea	Mali	Vietnam
Bulgaria	Guinea-Bissau	Mongolia	Yemen, North
China	India	Mozambique	Yemen, South
Congo	Iran	Nicaragua	Yugoslavia
Cuba	Iraq	Romania	Zambia
Djibouti			

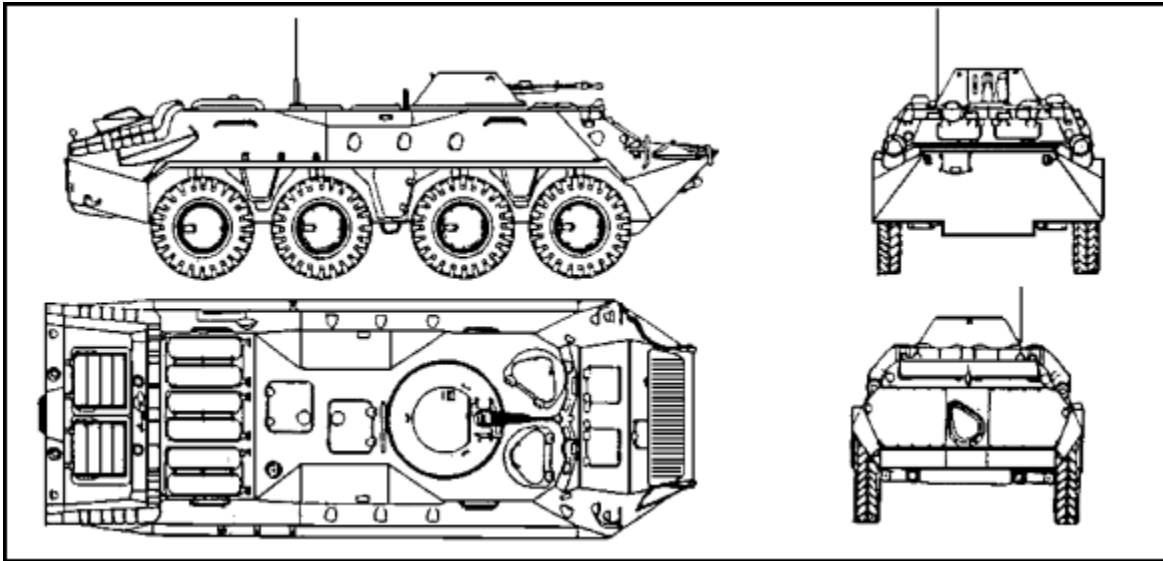


Figure 2-6. Soviet BTR-70 APC.

d. BTR-70 (Soviet) ([Figure 2-6](#)). The BTR-70s overall shape is similar to the BTR-60 series APC.

(1) Variants. A number of BTR-70 variants are presented in the following subparagraphs.

(a) BTR-70 with BTR-80 Turret. A number of BTR-70 APCs have been observed fitted with the turret of the more recent BTR-80, which is discussed in the next section. Besides the turret change, additional firing ports have been installed in the very top of each side of the troop compartment between the hull sides and the roof.

(b) BTR-70 with AGS-17. A number of these versions have been observed in Afghanistan fitted with the pintel-mounted 30-mm AGS-17 automatic grenade launcher on the roof to the rear of the driver and commander. The machine gun turrets on these vehicles are retained.

(c) BTR-70MS. A turretless communications vehicle.

(d) BTR-70 KShM. A command/staff vehicle.

(e) BREM (Armored Repair and Recovery Vehicle). A BTR-70 fitted with a bow-mounted jib crane and no turret.

(2) Recognition Features. The BTR-70 has

- an overall shape similar to the BTR-60 series.
- three forward-facing periscopes and one sidefacing periscope for observation to the front and sides for both the commander and driver.
- a turret identical to that fitted to the BTR-60PB and the BRDM-2 amphibious scout car.

- a commander's single-piece front-opening hatch cover and a driver's single-piece rear-opening hatch cover.
- two front windows, one for the commander and one for the driver, which are covered in combat by an armored hatch cover hinged at the top.
- three firing ports and one vision block in each side the troop compartment to the rear.
- two square roof hatches over the top of the troop compartment, each with a circular firing port.
- a prominent gap between the second and third wheels.
- cigar-shaped exhaust pipes mounted high on the rear of the hull that run down each side towards the rear.
- a single-piece rear-mounted hydro-jet cover.
- a trim vane that is erected at the front of the hull before entering the water and stowed on the top of the hull when travelling. On the BTR-60 series the trim vane is carried under the nose of the vehicle.
- split rim wheels.
- two foot steps on each side, between the first and second and third and fourth wheels and two small half doors, one on each side, that open forward between the second and third wheels
- a low-silhouette stretched body.

(3) Vehicle Characteristics. The BTR-70 is a fully amphibious vehicle that is propelled through the water by a single water jet at the rear of the hull. The vehicle has an all-welded hull with improved protection over its frontal arc, as compared to the original BTR-60 series. The nose is also wider and the front of the vehicle provides added protection to the front wheels. The commander and driver are seated at the front with the commander on the right and the driver on the left. The troop compartment is to the rear of the turret and the engine compartment is at the rear of the vehicle. The BTR-70 has a filtration and overpressurization system for NBC protection. Specifications for the BTR-70 are provided in the lists and paragraphs that follow.

## BTR-70 Measurements

<u>Crew</u> , 3.	<u>Ground clearance</u> , 0.475 meters.
<u>Passengers</u> , 8.	<u>Track</u> , 2.38 meters.
<u>Configuration</u> , 8 x 8.	<u>Wheelbase</u> , 4.4 meters.
<u>Combat weight</u> , 11,500 kg.	<u>Maximum road speed</u> , 80 km/h.
<u>Length</u> , 7.535 meters.	<u>Maximum water speed</u> , 10 km/h.
<u>Width</u> , 2.8 meters.	<u>Fuel capacity</u> , 350 liters (estimated).
<u>Height to turret top</u> , 2.235 meters.	<u>Maximum road range with external fuel tanks</u> , 600 km.
<u>Height to top of sight</u> , 2.32 meters.	

## BTR-70 Armor

<u>Hull</u>	<u>Turret</u>
10 mm	7 mm

(4) Vehicle Capabilities. The BTR-70 can

- cross a 2.0-meter trench.
- mount a 0.5-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The BTR-70 has two layers of armament: main and secondary.

(a) Main Armament. BTR-70 main armament is a 14.5-mm KPVT heavy machine gun mounted in the forward part of the vehicle. The practical rate of fire for the 14.5-mm gun is 150 rds/min with a basic load of 500 rounds.

(b) Secondary Armament. Secondary armament on the BTR-60PB is a 7.62-mm PKT machine gun mounted coaxially to the right with the telescopic sight mounted coaxially to the left. A practical rate of fire for the 7.62-mm gun is 250 rds/min with a basic load of 2,000 rounds.

(6) Countries Served. The BTR-70 is in service with (East) Germany and the Soviet Union and may be licensed for production in Romania as the TAB-77.

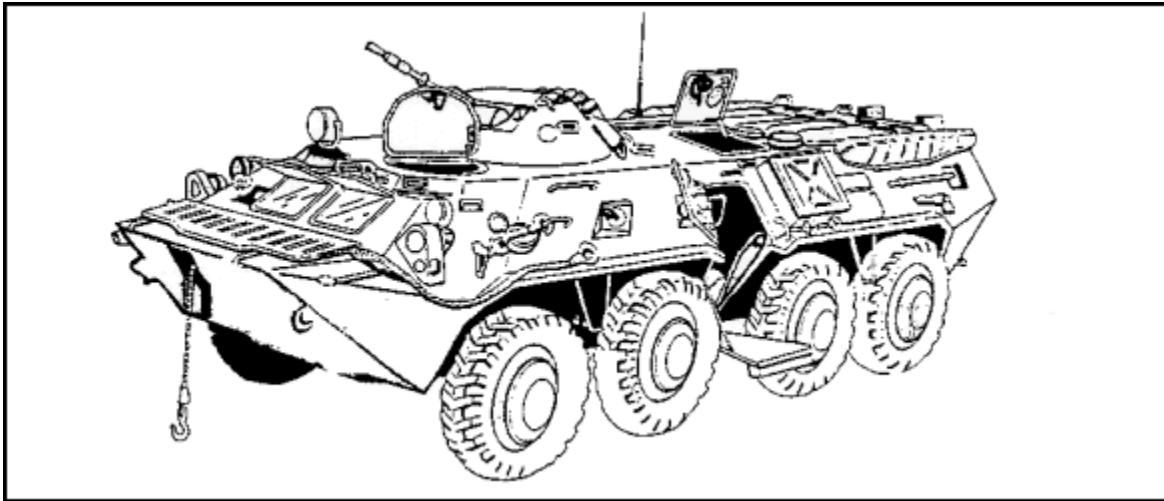


Figure 2-7. Soviet BTR-80 APC.

e. BTR-80 (Soviet) ([Figure 2-7](#)). BTR-80 overall shape is similar to the BTR-60 and BTR-70 series APCs.

(1) Variants. None.

(2) Recognition Features. In addition to the similar features between the BTR-60 and BTR-70 series, the BTR-80 has

- a new hatch arrangement between the second and third wheels, the upper half opens to the front and the lower half opens downward to form a ramp. This configuration gives dismounting troops some protection against small arms fire from the front of the vehicle.
- six forward-firing electrically-operated smoke dischargers mounted on the rear of the turret.
- a turret-mounted machine gun that can now fire to an elevation of +60 degrees instead of +30 degrees as with the earlier model BTRs (developed for mountain fighting and ADA).
- three redesigned and repositioned round-shaped firing ports on each side of the hull that are angled obliquely to enable the troops to fire forward.
- two upper hatches on the troop compartment have two firing ports for engaging high targets.
- two water jets fitted at the rear of the hull.

(3) Vehicle Characteristics. The BTR-80 is a fully amphibious vehicle and shares similar characteristics with both the BTR-60 and BTR-70 series APCs including a filtration and overpressurization system for NBC protection. Specifications for the BTR-80 are provided in the lists and paragraphs that follow.



## BTR-80 Measurements

<u>Crew</u> , 3.	<u>Maximum road speed</u> , 80 to 85 km/h.
<u>Passengers</u> , 9.	<u>Maximum water speed</u> , 10 km/h.
<u>Configuration</u> , 8 x 8.	<u>Fuel capacity</u> , 290 liters
<u>Combat weight</u> , 11,000 kg.	<u>Maximum road range</u> , 500 km.
<u>Length</u> , 7.535 meters.	
<u>Width</u> , 2.8 meters.	
<u>Height to turret top</u> , 2.235 meters.	

## BTR-80 Armor

Hull  
25 mm

Turret  
7 mm

(4) Vehicle Capabilities. The BTR-80 can

- cross a 2.0-meter trench.
- mount a 0.4-meter vertical step.
- climb a 30-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The BTR-80 has two layers of armament: main and secondary. The new elevation modification increases the antiaircraft capability and is useful in engaging targets on steep mountainsides.

(a) Main Armament. BTR-80 main armament is a 14.5mm KPVT heavy machine gun mounted in the forward part of the vehicle. The practical rate of fire for this weapon is 150 rds/min with a basic load of 500 rounds.

(b) Secondary Armament. Secondary armament on the BTR-80 is a 7.62-mm PKT coaxially-mounted machine gun. A practical rate of fire for this weapon is 250 rds/min with a basic load of 2,000 rounds.

(6) Countries Served. The BTR-80 is in service with the Soviet Union.

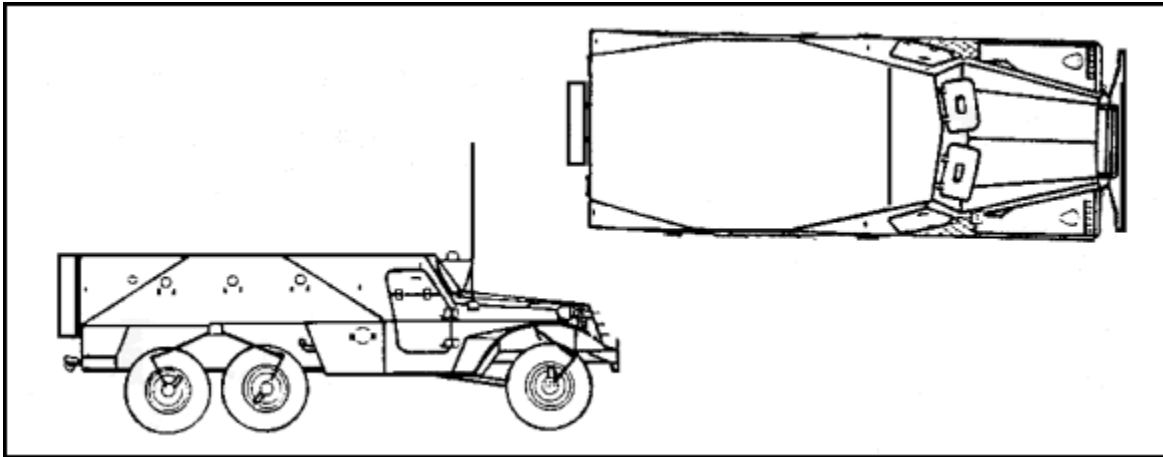


Figure 2-8. Soviet BTR-152 APC.

f. BTR-152 (Soviet) ([Figure 2-8](#)). The basic BTR-152 has no winch, open top and no tire pressure control lines.

(1) Variants. A number of BTR-152 variants are discussed below.

(a) BTR-152V1. This version has a winch, open top and external tire pressure control lines.

(b) BTR-152V2. This version has internal tire pressure control lines and no winch.

(c) BTR-152V3. This version has a winch on the front, open top, infrared driving lights and internal tire pressure control lines.

(d) BTR-152K. This is a BTR-152V2 with full overhead cover.

(e) BTR-152U. This is a command vehicle with a significantly higher full cover roof. This vehicle normally tows a trailer carrying additional equipment.

(f) BTR-152A. This is an anti-aircraft version with a twin 14.5-mm KPV heavy machine gun in a manually operated turret.

(g) BTR-152 w/Quad 12.7-mm M53 Machine Gun. This version is in Egyptian use only.

(h) BTR-152 w/Twin 23-mm (ZU-23) Anti-aircraft Gun. This version is used by the PLO.

(2) Recognition Features. The basic BTR-152 has

- a typical truck-like appearance.
- a box-like troop compartment with angled sides.
- top hinged protective hatches for the front windows.
- three firing ports on each side of the troop compartment.

(3) Vehicle Characteristics. The BTR-152 is a nonamphibious vehicle that has an improved (6 x 6) truck chassis and an all-welded steel hull. The troop compartment is to the rear of the cab and the engine is in front. Specifications for the BTR-152 are provided in the lists and paragraphs that follow.

#### BTR-152 Measurements

<u>Crew</u> , 2.	<u>Height</u> , 2.04 meters.
<u>Passenger load</u> , 17 to 18.	<u>Ground clearance</u> , 0.30 meters.
<u>Configuration</u> , 6 x 6.	<u>Maximum road speed</u> , 65 km/h.
<u>Combat weight</u> , 8,950 kg.	<u>Fuel capacity</u> , 300 liters.
<u>Length</u> , 6.83 meters.	<u>Maximum road range</u> , 780 km.
<u>Width</u> , 2.32 meters.	

#### Hull Armor Thickness

14-mm

(4) Vehicle Capabilities. The BTR-152 can

- cross a 0.80-meter trench.
- mount a 0.60-meter vertical step.
- climb a 30-percent grade.
- ford 0.80 meters.

(5) Armament Characteristics. The BTR-152A twin 14.5-mm guns have a practical rate of fire of 150 rds/min with a basic load of 2,000 rounds. Models mounting the 12.7- and 7.62-mm guns have a practical rate of fire in rds/min of 80 to 100 for the 12.7-mm gun and 200 to 250 for the 7.62-mm gun. Basic load for the 12.7-mm gun is 500 and for the 7.62-mm gun, 2,000 to 3,000.

(6) Countries Served. The BTR-152 is in service with the following countries.

Afghanistan	Egypt	Israel	Sudan
Albania	Ethiopia	Laos	Syria
Algeria	Germany, (East)	Korea, North	Tanzania
Angola	Guinea	Mali	Uganda
Bulgaria	Guinea-Bissau	Mongolia	Soviet Union
Central African Republic	Hungary	Mozambique	Vietnam
Chad	India	Poland	Yemen, North
China	Indonesia	Romania	Yemen, South
Congo	Iran	Somalia	Yugoslavia
Cuba	Iraq	Sri Lanka	Zimbabwe

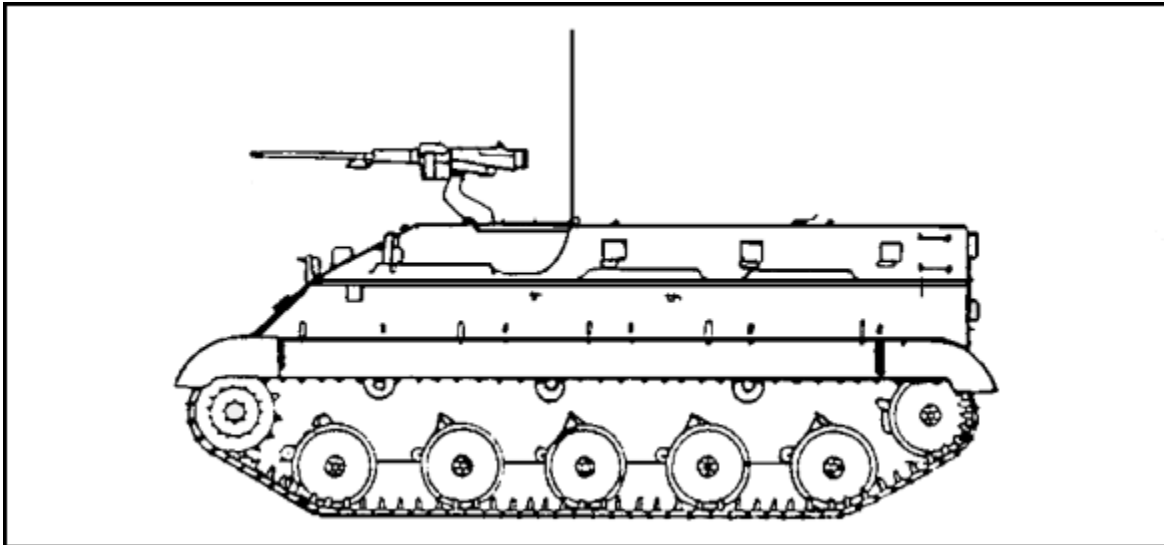


Figure 2-9. Yugoslavian M-60P APC.

g. M-60P (Yugoslavian) (Figure 2-9). The M-60P is similar to the Western armored personnel carriers such as the American M59, M113 and the British FV432.

(1) M-60PB Anti-tank Variant. Mounted on top of the M60PBs hull, on the left side, are two 82-mm recoilless rifles on a rotating mount. The M-60PB has also been observed with the recoilless rifles mounted on the top right side of the hull. The gunner has a single-piece hatch cover that opens forward and a suspended seat that moves with the rifles. To the right of the mount is a hatch for the loader. The recoilless rifles have a rate of fire of four to five rds/min.

(2) Recognition Features. The M-60P has

- torsion bar suspension that consists of five single rubber-tired road wheels with the drive sprocket at the front and the idler at the rear, and three track return rollers.
- the running gear outside of the hull armor and its top part is covered by a light sheet metal guard.
- a single-piece rear-opening driver's hatch cover with an integral periscope that can be replaced by an infrared periscope for driving at night.
- a co-driver's hatch cover with an integral periscope that opens to the rear.
- a single-piece commander's hatch cover.
- a machine gunner's cupola that can be traversed 360 degrees. The cupola has a two-piece hatch cover that opens to each side of the machine gunner for protection.
- twin entry/exit doors at the rear of the hull.
- hatches in the roof of the troop compartment.

- three observation ports in each side of the hull and one in each of the rear doors.
- a spare road wheel on the rear left side of the hull and a jerry can on the rear right side of the hull.

(3) Vehicle Characteristics. The M-60P is a nonamphibious vehicle with an all-welded steel hull that provides protection from small arms fire. The driver sits at the front of the vehicle on the left side and the co-driver sits on the right side. The co-driver also operates the bow-mounted machine gun. The commander sits to the rear of the driver and the gunner sits to the rear of the co-driver. Specifications for the M-60P are provided in the lists and paragraphs that follow.

#### M-60P Measurements

<u>Crew</u> , 3.	<u>Ground clearance</u> , 0.4 meters.
<u>Passengers</u> , 10.	<u>Track</u> , 2.385 meters.
<u>Combat weight</u> , 11,000 kg.	<u>Track width</u> , 400 mm.
<u>Length</u> , 5.02 meters.	<u>Length of track on ground</u> , 2.94 meters.
<u>Width</u> , 2.7 meters.	<u>Maximum road speed</u> , 45 km/h.
<u>Height without armament</u> , 1.86 meters.	<u>Fuel capacity</u> , 150 liters
<u>Height with armament</u> , 2.385 meters.	<u>Maximum road range</u> , 400 km.
	<u>Maximum off-road range</u> , 250 km.

#### M-60P Armor

<u>Maximum</u>	<u>Minimum</u>
25 mm	10 mm

(4) Vehicle Capabilities. The M-60P can

- cross a 2.0-meter trench.
- mount a 0.6-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent grade.
- ford 1.35 meters in still water.
- ford 1.25 meters in running water.

(5) Armament Characteristics. The M-60P has two layers of armament: main and secondary.

(a) Main Armament. The M-60P has a 12.7-mm M2 HB anti-aircraft machine gun that can be moved from the cupola to a tripod that is carried on the right side for a ground fire role.

(b) Secondary Armament. Secondary armament on the M-60P is a 7.92-mm machine gun mounted in the bow.

(6) Countries Served. The M-60P is in service with Yugoslavia.

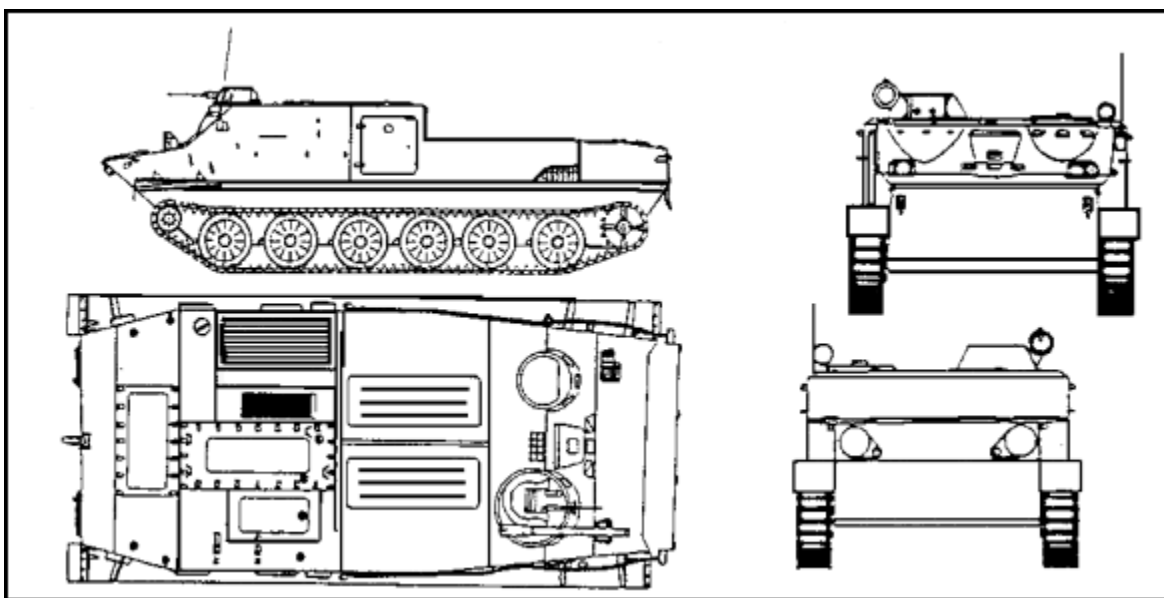


Figure 2-10. Czechoslovakian/Polish OT-62 APC (TOPAS).

h. OT-62 (TOPAS) (Czechoslovakia and Poland) (Figure 2-10). The OT-62 is a tracked amphibious vehicle that was jointly developed and used by Czechoslovakia and Poland. It is equivalent to the Soviet BTR-50PK APC and in appearance is almost identical to the BTR-50PU model 2 command vehicle with some significant differences. These differences include higher road and water speeds, a fully enclosed troop compartment and in some versions, fully-enclosed armament installations rather than simple pintle-mounted machine guns. TOPAS is the official designation of this armored personnel carrier with the designation "OT-62" often being used in the West. The Western term "OT-62" will be used principally in this lesson.

(1) Variants. The OT-62A is the basic version of the OT-62 series APCs and has no fixed armament. Some variants include a command vehicle, armored ambulance and light armored recovery vehicle (TOPAS-WPT). Other OT-62 variants are discussed below.

(a) OT-62B (TOPAS-2A). This version is used only by Czechoslovakia and has a mini-turret on the right front of the vehicle, which mounts a 82-mm recoilless gun externally and 7.62mm machine gun internally. Maximum rate of fire in rds/min for the 82-mm gun is one plus, depending upon the availability of an outside loader. Basic load for the 82-mm gun is 5 to 10 rounds.

(b) OT-62C (TOPAS-2AP). This version has a turret similar to the Soviet BTR-60PB. Main armament is a 14.5-mm heavy machine gun mounted in the turret over the troop compartment. Secondary armament is a coaxially-mounted 7.62-mm machine gun. A practical rate of fire for the 14.5-mm gun is 150 rds/min with a basic load of 500 rounds. A practical rate of fire for the 7.62mm gun is 200 rds/min with a basic load of 1,000 to 2,000 rounds. This version and the modified OT-62C version below are used only by the Polish Armed Forces within the Warsaw Pact.

(c) OT-62C Modified (TOPAS-2AP). This version carries two 82-mm mortars and their crews. The mortars have a rate of fire of 25 rds/min with a load of 50 to 100 rounds.

(2) Recognition Features. The OT-62 has

- six road wheels, no return rollers and a torsion bar suspension.
- a wedge-shaped front and a lowered rear.
- an enlarged bay on the right side of the crew compartment.
- entry/exit doors on both sides of the troop compartment.
- a commander's cupola with a periscope mounted in the forward part and a hatch cover that opens forward and can be locked vertically.
- three commander's periscopes mounted in the front part of the left projecting bay.
- a driver's single-piece hatch cover in front of the vehicle that opens upward and has an integral vision block.
- three periscopes below the driver's hatch cover.
- three observation periscopes in the right projecting bay.

(3) Vehicle Characteristics. The OT-62 is a fully amphibious vehicle that is propelled through the water by canted twin water jets in the rear. The hull is all-welded construction with the crew compartment at the front, troop compartment at the center and the engine at the rear. The commander is seated at the front of the vehicle in the left projecting bay with the driver seated to the right of the commander. Specifications for the OT62 are provided in the lists and paragraphs that follow.

#### OT-62 Measurements

Crew, 2 (plus a gunner in turreted versions).

Passengers, 18 to 20.

Combat weight, 15,000 kg.

Length, 7.10 meters.

Width, 3.14 meters.

Ground clearance, 0.41 meters.

Maximum speed, 60 km/h.

Maximum water speed, 10 km/h.

Fuel capacity, 400 liters.

Maximum range, 400 km.

#### OT-62 Armor

Hull  
14 mm

Turret  
7 mm (OT-62B and OT-62C)

(4) Vehicle Capabilities. The OT-62 can

- cross a 2.8-meter trench.
- mount a 0.9-meter vertical step.
- climb a 38-percent grade.
- ford amphibiously.

(5) Armament Characteristics. Armament between OT-62 versions vary and are discussed in paragraph (1) above.

(6) Countries Served. Czechoslovakia and Poland.

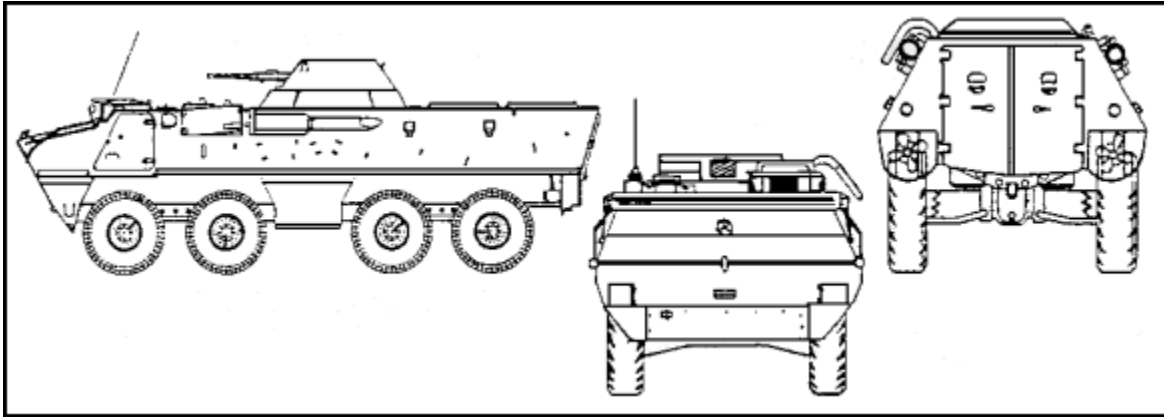


Figure 2-11. Czechoslovakian OT-64C(1) (SKOT).

i. OT-64C(1) (SKOT) (Czechoslovakian and Polish) ([Figure 2-11](#)). Jointly developed and used by Czechoslovakia and Poland in place of the similar Soviet BTR-60 (8 x 8) APC, the OT-64 (SKOT) is the official designation of this armored personnel carrier with the designation "OT-64" often being used in the West. Although a variant of the basic OT-64, the OT-64C(1) will be discussed in this lesson as the principle OT-64 APC.

(1) Variants. A number of OT-64 variants are presented in the following subparagraphs:

(a) OT-64A (SKOT). The basic member of the OT-64 series of vehicles, the OT-64As used by Czechoslovakia are unarmed while those used by Poland are fitted on both sides with open pintle mounts for 7.62-mm machine guns. Five hatches are fitted over the troop compartment, two open to the left of the vehicle, two open to the right of the vehicle and the center one opens forward. The five hatches can be locked vertical. Some OT-64As have been observed with two Sagger ATGWs mounted over the top of the troop compartment. Four Sagger ATGWs are carried.

(b) OT-64B (SKOT-2). This model has been used only by Poland and has a pintle-mounted 7.62-mm or 12.7-mm machine gun. The gun has a shield that gives front and side protection to the gunner, but has an open top and open rear. The OT-64B has three hatches over the troop compartment: one opens forward and the other two open to each side.

(c) OT-64C(1) (SKOT-2A). This is the version principally discussed in this lesson.



(d) OT-64C(1) with OT-64B Turret. This version is used by Morocco with the original turret replaced by the same turret as installed on the OT-62B full-tracked APC.

(e) OT-64C(2) (SKOT-2AP). This version is used only by Poland and is similar to the OT-64C(1) except that it has a new turret with a curved top. It is armed with a 14.5-mm KPVT machine gun with a 7.62-mm PKT machine gun mounted to the right of the main armament and the sight to the left. The weapons have an increased elevation capability, which allows them to be used against aircraft. Some vehicles have been observed with a single Sagger ATGW mounted on each side of the turret. The turret on this model is also installed on the OT-62C tracked APC.

(f) OT-64 Command Vehicles (R-2 and R-3). These two command models of the OT-64 have additional communications equipment and radio antennas.

(g) OT-64 Recovery Vehicle (SKOT-WPT). A recovery vehicle based on the OT-64 is known to be in service with Poland. This is armed with a 7.62-mm PKT machine gun and is provided with a light crane for changing components in the field.

(2) Recognition Features. The OT-64C (1) has

- an 8 x 8 chassis with space in middle of vehicle between the second and third axles.
- a wedge-shaped front and flat rear.
- a one-man centrally-mounted turret similar to those fitted to the Soviet BRDM-2 (4 x 4) reconnaissance vehicle, discussed later in this lesson, and the BTR-60PB, discussed previously.
- a single-piece rear-opening door on each side beside the commander and driver.
- a driver's single-piece hatch cover that opens to the rear and three periscopes for vision to his front and sides.
- a commander's single-piece hatch cover that opens forward with a periscope in the forward part which can be traversed through 360 degrees.
- a searchlight mounted to the roof between the driver's and commander's positions.
- air inlets and outlets for the engine on top of the hull and exhaust pipes on each side of the hull.
- the turret mounted on an eight-sided plinth (lower turret platform) for weapon depression.
- two troop entry/exit doors in the rear of the hull, each with a firing port.

- four roof hatches that are hinged on the outside and can be locked vertically, each with a firing port.
- two firing ports in each side of the troop compartment.
- a trim vane that is erected on the front of the vehicle before entering the water and stowed on the glacis plate when travelling.
- a winch mounted at the front of the hull.

(3) Vehicle Characteristics. The OT-64C(1) is a fully amphibious vehicle that is propelled through the water by two propellers mounted at the rear of the hull. The vehicle has an all-welded steel hull with the crew compartment at the very front, engine immediately behind and the troop compartment at the very rear. The vehicle is steered by the front four wheels. The driver is seated at the front of the vehicle on the left side with the commander to the driver's right. Specifications for the SKOT OT-64C(1) are provided in the lists and paragraphs that follow.

#### OT-64C(1) Measurements

<u>Crew</u> , 2.	<u>Firing height</u> , 2.5 meters.
<u>Passengers</u> , 15.	<u>Ground clearance</u> , 0.46 meters.
<u>Configuration</u> , 8 x 8.	<u>Track</u> , 1.86 meters.
<u>Combat weight</u> , 14,500 kg.	<u>Wheelbase</u> , 1.3 + 2.15 + 1.3 meters.
<u>Length</u> , 7.44 meters.	<u>Maximum road speed</u> , 94 km/h.
<u>Width</u> , 2.55 meters.	<u>Maximum water speed</u> , 9 km/h.
<u>Height to turret top</u> , 2.71 meters.	<u>Fuel capacity</u> , 320 liters (estimated).
<u>Height to top of hull</u> , 2.06 meters.	<u>Maximum road range</u> , 710 km.

#### OT-64C(1) Armor

<u>Hull</u>	<u>Turret</u>
10 mm	14 mm

(4) Vehicle Capabilities. The OT-64C(1) can

- cross a 2.0-meter trench.
- mount a 0.5-meter vertical step.
- climb a 60-percent grade.
- climb a 30-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The OT-64C(1) has two layers of armament: main and secondary. Some models have been observed with a single Sagger ATGW mounted on each side of the turret with lateral armor protection.

(a) Main Armament. OT-64C(1) main armament is a 14.5-mm heavy machine gun mounted in the forward part of the vehicle. The practical rate of fire for this gun is 150 rds/min with a basic load of 500 rounds.

(b) Secondary Armament. OT-64C(1) secondary armament is a 7.62-mm gun mounted coaxially to the right of the main armament with the telescopic sight to the left. A practical rate of fire for this weapon is 250 rds/min with a basic load of 2,000 rounds.

(6) Countries Served. The OT-64CA(1) is in service with the following countries.

Czechoslovakia  
Hungary  
India

Iraq  
Libya  
Morocco

Poland  
Sudan

Syria  
Uganda

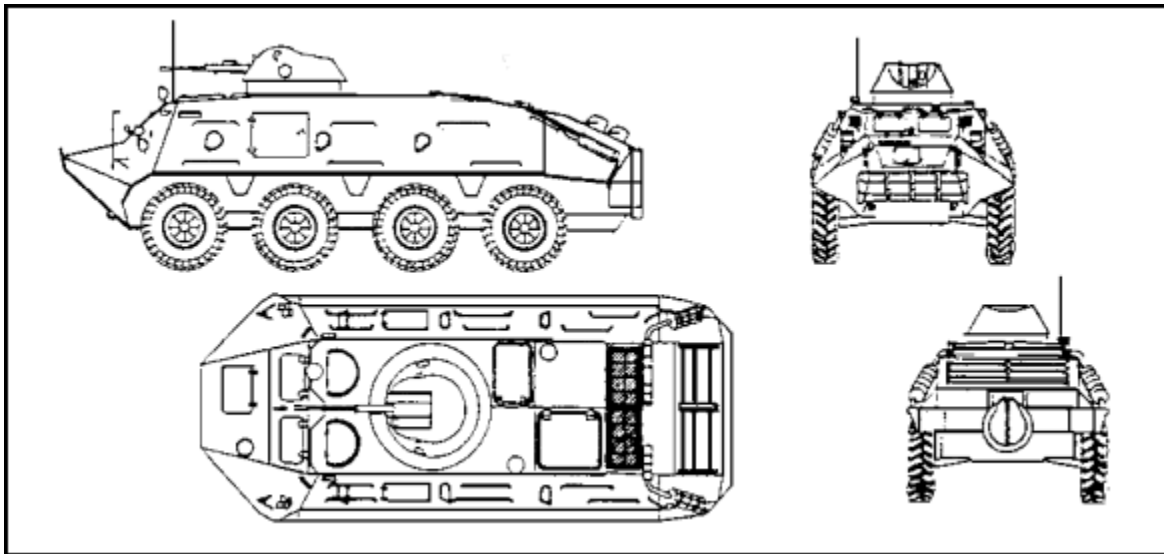


Figure 2-12. Romanian TAB-72 APC.

j. TAB-71/TAB-72/TAB-77 (Romanian) (Figure 2-12). The TAB series APCs are similar to some of the BTR-60 and BTR-70 series APCs discussed previously and will not be discussed in detail in this lesson.

(1) TAB-73 82-mm Mortar Carrier Variant. This is the only known variant of the TAB series APCs and is essentially a TAB-72 with its turret removed and modifications made to the troop compartment to allow the 82-mm mortar to be raised when the roof hatches are swung open. Between 50 and 100 mortars bombs are carried onboard the TAB-73.

(2) Recognition Features. The TAB-71 is very similar to the Soviet original open-topped BTR-60 version. The TAB-71 is not believed to have been built in large numbers and it was soon followed by the TAB-72. The TAB-72 is almost identical to the Soviet BTR-60PB with a slightly different turret, an increased elevation for the 14.5-mm and 7.62-mm machine guns and a distinct gun sight on the left side of the turret. The TAB-72 was succeeded by the TAB-77, which is a copy of the Soviet BTR-70 with the only known difference being an AT-3 Sagger ATGW mounted on each side of the turret. There is also believed to be a 4 x 4 version of the TAB series APC, called the TAB-C, with a much

shorter hull for use in a reconnaissance role. The TAB-72 APC will be the TAB version principally discussed in this lesson.

(3) Vehicle Characteristics. The TAB-72 APC is an amphibious vehicle with an all-welded steel hull. Specifications for the TAB-72 are provided in the lists and paragraphs that follow.

#### TAB-72 Measurements

<u>Crew</u> , 3.	<u>Ground clearance</u> , 0.47 meters.
<u>Passengers</u> , 8.	<u>Wheelbase</u> , 4.21 meters.
<u>Configuration</u> , 8 x 8.	<u>Maximum road speed</u> , 95 km/h.
<u>Combat weight</u> , 11,000 kg.	<u>Maximum water speed</u> , 10 km/h.
<u>Length</u> , 7.22 meters.	<u>Fuel capacity</u> , 290 liters
<u>Width</u> , 2.83 meters.	<u>Maximum road range</u> , 500 km.
<u>Height</u> , 2.7 meters.	

#### TAB-72 Armor

<u>Hull (maximum)</u>	<u>Turret (maximum)</u>
9 mm	7 mm

(4) Vehicle Capabilities. The TAB-72 can

- cross a 2.0-meter trench.
- mount a 0.4-meter vertical step.
- climb a 60-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The TAB-72 has two layers of armament: main and secondary.

(a) Main Armament. TAB-72 main armament is a 14.5mm KPVT turret-mounted heavy machine gun with a practical rate of fire of 150 rds/min with a basic ammunition load of 500 rounds.

(b) Secondary Armament. TAB-72 secondary armament is a 7.92-mm machine gun with a basic load of 2,000 rounds.

(6) Countries Served. The TAB series APCs are in service with Romania and Yugoslavia.

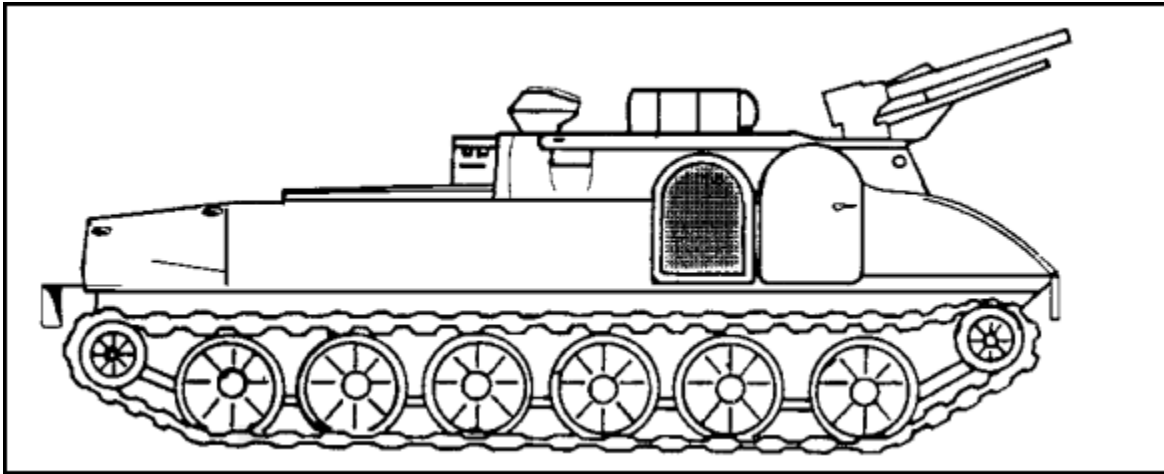


Figure 2-13. Chinese Type 77-2 APC.

k. Type 77 APC (China) ([Figure 2-13](#)). The Type 77 is very similar to the Soviet BTR-50PK APC but has improved road and water speeds. Many of the automotive components of the Type 77 APC are also used in the Type 63 light amphibious tank.

(1) Variants. Two variants are presented in the following two paragraphs.

(a) HQ-2J SAM Carrier. This version has a much modified Type 77 APC chassis with seven, rather than six, road wheels on each side. Recently developed, this version will act as the transporter/launcher platform for the HQ-2J SAM, the Chinese equivalent of the Soviet SA-2 Guideline.

(b) Miscellaneous. The Type 77 can be used as an ambulance, command post, fuel resupply vehicle and load carrier in addition to filling its basic APC role. The Type-1 has three loading ramps that can be positioned at the rear to enable an 85mm Type 56 gun (with a crew of eight and 30 rounds of ammunition) or a 122-mm Type 54 howitzer (with a crew of eight and 20 rounds of ammunition) to be carried; the Type 77-2 has no loading ramps.

(2) Recognition Features. The Type 77 has

- torsion bar suspension that consists of six rubber-tired road wheels with the idler at the front, drive sprocket at the rear and no track return rollers.
- a single-piece driver's hatch cover that opens to the right and three forward-facing periscopes.
- a single circular commander's hatch cover that opens to the rear and three forward observation periscopes.
- hatches in the roof of the troop compartment and a single forward-opening door in the right side.
- three firing ports; two in the left and one in the right side of the troop compartment.

- a white light searchlight mounted on top of the troop compartment to the left front.
- two water jets at the rear.
- a trim vane mounted at the front of the hull for fording.

(3) Vehicle Characteristics. The Type 77 has an allwelded hull and is fully amphibious, being propelled through the water by two water jets at the rear of the hull. The commander sits in a projecting bay at the front on the right side and the driver sits at the front on the left side. Specifications for the Type 77 are provided in the lists and paragraphs that follow.

#### Type 77 Measurements

<u>Crew</u> , 2.	<u>Length of track on ground</u> , 4.4 meters.
<u>Passengers</u> , 16.	<u>Maximum road speed</u> , 60 km/h.
<u>Combat weight</u> , 15,500 kg.	<u>Maximum water speed</u> , 11-12 km/h.
<u>Length</u> , 7.4 meters.	<u>Fuel capacity</u> , 416 liters
<u>Width</u> , 3.2 meters.	<u>Maximum road range</u> , 370 km.
<u>Height</u> , 2.436 meters.	<u>Maximum water range</u> , 120 km.
<u>Track</u> , 2.8 meters.	
<u>Track width</u> , 400 mm.	

(4) Vehicle Capabilities. The Type 77 can

- cross a 2.9-meter trench.
- mount a 0.87-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type 77 has one layer of armament that consists of a single 12.7-mm heavy machine gun that has a basic load of 500 rounds. This weapon is a copy of the Soviet DShKM weapon. The tank commander has no protection while firing the 12.7-mm gun.

(6) Countries Served. The Type 77 is in service with China.

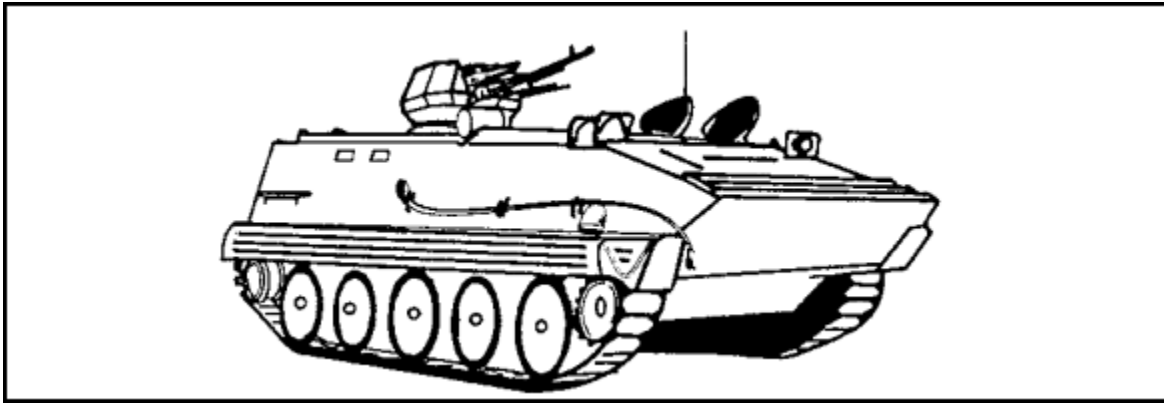


Figure 2-14. Chinese Type 85 APC.

1. Type 85 APC (Formally YW 531 H) (China) (Figure 2-14). The Type 531 H was recently renamed the Type 85 and will be discussed as the Type 85. The Type 85 (formally Type 531 H) APC was developed at the same time as the Type YW 534, which is discussed later, and is believed to be the successor to the older Type YW 531. The Type 85 is almost identical to the Type YW 534 with some minor differences. It is slightly lighter, shorter and narrower, does not have the four smoke dischargers on each side of the forward part of the hull, and has three firing ports and vision devices in the left hull side.

(1) Variants. A number of Type 85 variants are presented in the following paragraphs.

(a) Type YW 309 Infantry Combat Vehicle. This is essentially the Type 85 fitted with the turret of the WZ 501 Infantry Fighting Vehicle (IFV) which itself is a copy of the Soviet BMP-1, discussed in a later section. In addition to the single firing port in the rear hull door there are three firing ports and periscopes in the left side of the hull and four firing ports and periscopes in the right side of the hull. The YW 309 has a crew of three and carries eight fully equipped infantrymen. A 7.62-mm machine gun is mounted coaxially with the main armament and there is a red Arrow 73 ATGW launcher over the main armament. This is also called the Infantry Fighting Vehicle Type 85.

(b) Type 85 Armored Command Post. This version is similar to the Type 85 but has a crew of two and carries six staff officers plus extensive communications equipment for which three radio antenna are provided. The driver sits at the front left and the commander, who also mans the 12.7-mm anti-aircraft gun is seated to his rear. The command area is at the very rear and has four circular roof hatches, one in each corner. The armored command post weighs 13,800 kg loaded. In addition, a four-barrelled smoke discharger is mounted on each side of the forward part of the hull.

(c) Type WZ 751 Armored Ambulance. This vehicle is also based on the Type 85 but has a new raised hull rear and a larger commander's cupola to the rear of the driver that is fitted with an externally-mounted 12.7-mm anti-aircraft machine gun. This vehicle has a crew of two plus room for medical personnel, patients

and supplies. This vehicle is now called the Tracked Armored Ambulance Type 85.

(d) Armored Command Vehicle Type 85. This is the basic vehicle with its turret removed for use in the command role. It has a crew of two plus six command staff and an assortment of communications equipment. Externally it is recognizable by its pintle-mounted 12.7-mm machine gun and three radio antenna.

(e) 120-mm Self-propelled Mortar Type 85. This version is similar to the above and has a 120-mm mortar mounted in the rear which fires to the rear. A total of 50 rounds of ammunition are carried. This version carries a six-man crew, including the commander and driver.

(f) 82-mm Self-propelled Mortar Type 85. This version is similar to the above but with a slightly different hatch arrangement and the 82-mm mortar. The mortar is also capable of being deployed away from the vehicle if required. This version has a seven-man crew.

(g) 122-mm Self-propelled Howitzer. This is essentially the basic vehicle with its turret removed and with the 122-mm Chinese-built version of the 122-mm D-30 towed howitzer mounted at the top of the hull rear.

(h) Recovery Vehicle Type 85. This is a basic Type 85 retaining its cupola-mounted 12.7-mm machine gun but fitted with a hydraulic crane on the left side of the hull with a lifting capacity of one ton, a generator, welding equipment, special mounting and dismounting tools, tool cabinet and a five-man crew.

(i) Maintenance Engineering Vehicle Type 85. This version has a similar hull to the Type 85 ambulance with a raised roof at the rear but is fitted with a cupola-mounted 12.7-mm machine gun on the roof rather than the forward part of the hull. Equipment includes generator, boom, inertia dynamometer, air filter cleaner, oil filter cleaner and other special tools.

(j) Thai purchase of Type 85. These versions are having their Chinese 12.7-mm machine guns removed and replaced by US 12.7-mm machine guns which are standard on Thai tanks. Some specialized versions of the Type 85 include a 30-round multiple rocket launcher. The launcher is believed to be a 130-mm (30 round) Type 82 truck-mounted multiple rocket launcher system.

## (2) Recognition Features. The Type 85 has

- a torsion-bar suspension with each side having five dual rubber-tired road wheels, with drive sprocket at the front, idler at the rear and track return rollers.
- an engine compartment to the right of the driver with the air-inlet and air-outlet louvers in the roof and the exhaust pipe on the right side.



- a driver's left-opening single-piece hatch cover and three forward-facing periscopes, one of which can be replaced by an infrared device for night driving.
- a commander's single-piece hatch cover with an integral vision device.
- a troop compartment at the rear with the troops entering through a large door that is hinged on the right. This door has a vision block and a firing port.
- two firing ports and periscopes in the left side of the vehicle and three or four firing ports on the right side with a similar number of periscopes. (Other vehicles have been observed with three firing ports and periscopes in the left side and four in the right: there may well be differences between production vehicles.) The firing ports are provided with ball and socket type mountings for rifles.
- a single circular roof hatch on each side in the forward part of the troop compartment.
- two oblong roof hatches to the rear of the 12.7mm machine gun.
- a trim vane that is erected before the vehicle enters the water.

(3) Vehicle Characteristics. The Type 85 has an allwelded hull and is fully amphibious, being propelled through the water by its tracks. The driver sits at the front of the vehicle and the commander sits to the rear of the driver. The engine compartment is to the right of the driver. Specifications for the Type 85 are provided in the lists and paragraphs that follow.

#### Type 85 Measurements

<u>Crew</u> , 2.	<u>Ground clearance</u> , 0.46 meters.
<u>Passengers</u> , 13.	<u>Track</u> , 2.526 meters.
<u>Combat weight</u> , 13,600 kg.	<u>Track width</u> , 360 mm.
<u>Length</u> , 6.125 meters.	<u>Length of track on ground</u> , 3.275 meters.
<u>Width</u> , 3.06 meters.	<u>Maximum road speed</u> , 65 km/h.
<u>Height to top of hull</u> , 1.914 meters.	<u>Maximum water speed</u> , 6 km/h.
<u>Height including machine gun</u> , 2.586 meters.	<u>Maximum range</u> , 500 km.

(4) Vehicle Capabilities. The Type 85 can

- cross a 2.2-meter trench.
- mount a 0.6-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type 85 has one layer of armament that consists of a single 12.7-mm heavy machine gun with a basic load of 1120 rounds.

(6) Countries Served. The Type 85 is in service with China and Thailand.

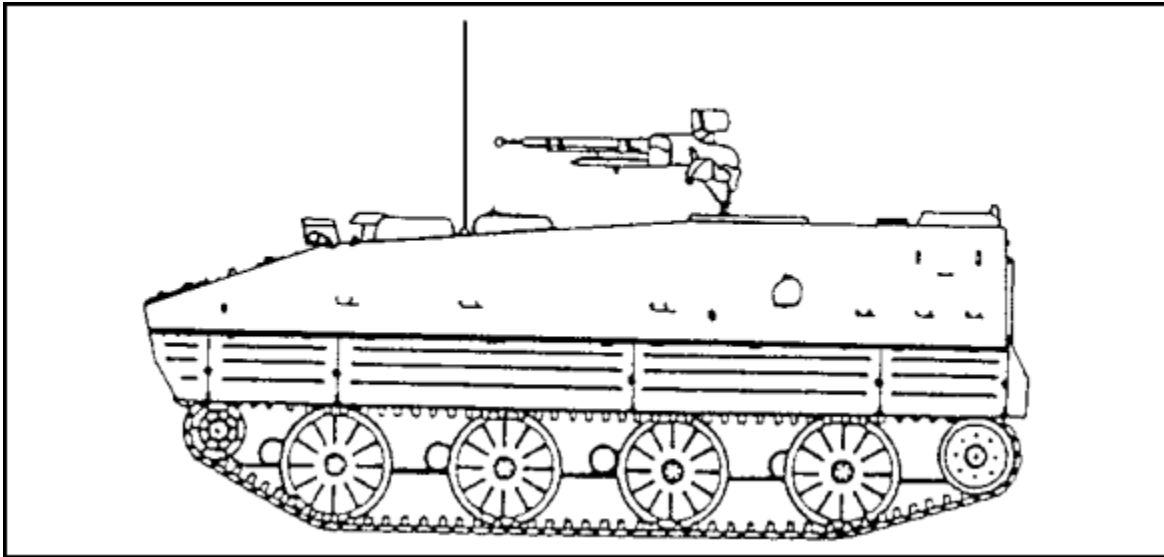


Figure 2-15. Chinese Type YW 531 APC with 12.7-mm Machine gun.

m. Type YW 531 APC (China) ([Figure 2-15](#)). The official Chinese designation for this vehicle is the Type 63 but within the Chinese Army it is referred to as the Type 531. The Australian Army has reported that the Type YW 531 has excellent cross country mobility. There are at least three sub-variants of the Type YW 531 APC which differ mainly in their communications equipment. These three sub-variants will not be discussed in this lesson.

(1) Variants. A number of Type YW 531 variants are presented in the subparagraphs that follow.

(a) YW 531C (Modified). This version has a number of improvements including a shield for the 12.7-mm machine gun, new vision ports and improved ventilation.

(b) Type YW 701 Command Post Vehicle. This version has a similar chassis and hull to the YW 750 ambulance. The vehicle has a maximum road speed of 60 km/h, a crew of three and can carry five passengers when being used in the command role. The vehicle would normally be used by regiment and division commanders. The Type YW 701s armament comprises a 7.62-mm Type 56-1 light machine gun with 1000 rounds of ammunition. The Type YW 701A has a 12.7-mm anti-aircraft machine gun with 560 rounds of ammunition.

(c) Ambulance. This vehicle has the Chinese designation YW750. It has a crew of two plus two doctors and can carry four stretcher or eight seated patients.

(d) 122-mm SPH. This vehicle is called the Type 54-1 self-propelled howitzer by the Chinese. It is a longer and slightly wider Type YW 531. The 122-mm howitzer sits in an open-topped troop compartment.

(e) Rocket Launcher. This version is called the 130-mm Type 70 19-barrel multiple rocket launcher.

(f) Type YW 304 82-mm Self-propelled Mortar. This vehicle is fitted with a turntable-mounted 82-mm mortar with a basic load of 120 rounds. The mortar can be dismounted for ground use. A 12.7-mm machine gun is mounted on the left side of the turret roof with an ammunition load of 560 rounds. The Type YW 304 has a crew of six or eight and is identical in physical characteristic to the Type YW 531 APC.

(g) Type YW 381 120-mm Self-propelled Mortar. This vehicle is fitted with a W86 120-mm mortar with an ammunition load of 50 mortar bombs. A baseplate and tripod are carried externally to allow the mortar to be dismounted for use in the ground role. A 12.7-mm machine gun is fitted for anti-aircraft and local defense. The vehicle has a crew of six and although similar in appearance to the YW 304 82-mm mortar, the 120-mm self-propelled mortar has a longer and wider chassis.

The Type YW 381 has a length of 6.125 meters, a width of 3.06 meters, a height of 2.593 meters, a track length on ground of 3.275 meters, a track of 2.526 meters and a ground clearance of 0.467 meters.

(h) Anti-tank Vehicle. It is known that a Type 531 APC has been fitted with a turret on the hull top towards the rear with four Red Arrow 8 ATGWs ready to launch. Additional missiles are carried inside for manual reloading. It is believed that this system has yet to enter service.

(i) Psychological Warfare. This version is fitted with roof-mounted loudspeakers.

(2) Recognition Features. The Type YW 531 has

- a torsion-bar suspension with each side having four single rubber-tired road wheels, a drive sprocket at the front, idler at the rear and no track return rollers.
- an engine compartment to the rear of the commander with the air-inlet and air-outlet louvers in the roof and the exhaust outlet in the right side of the roof.
- a driver's left-opening single-piece domed hatch cover in front of which are two periscopes.
- a commander's single-piece hatch cover that opens to the right with an integral periscope.
- a single-domed hatch cover for the third crew member that opens to the left with an integral periscope.
- a gunner's hatch to the rear of the vehicle with a 12.7-mm Type 54 heavy machine gun mounted on the forward part.
- another gunner's single-piece hatch cover.
- a troop compartment at the rear where troops enter and exit through a large door that is hinged on the right.

- a single firing port in each side of the hull.
- a trim vane that is erected before the vehicle enters the water and stowed on the glacis plate when travelling.

(3) Vehicle Characteristics. The Type YW 531 has an all-welded hull and is fully amphibious, being propelled through the water by its tracks. The driver and commander sit at the front of the vehicle with the driver on the left and the commander on the right. The loader sits behind the driver and the gunner's position is to the rear of the vehicle in the roof. The engine compartment is behind the commander. Specifications for the Type YW 531 are provided in the lists and paragraphs that follow.

#### Type YW 531 Measurements

<u>Crew</u> , 4.	<u>Ground clearance</u> , 0.45 meters.
<u>Passengers</u> , 13.	<u>Track</u> , 2.464 meters.
<u>Combat weight</u> , 12,600 kg.	<u>Track width</u> , 433 mm.
<u>Length</u> , 5.476 meters.	<u>Length of track on ground</u> , 3.095 meters.
<u>Width</u> , 2.978 meters.	<u>Maximum road speed</u> , 65 km/h.
<u>Height overall</u> , 2.58 meters.	<u>Maximum water speed</u> , 6 km/h.
<u>Height to top of hull</u> , 1.887 meters.	<u>Fuel capacity</u> , 450 liters.
	<u>Maximum road range</u> , 500 km.

(4) Vehicle Capabilities. The Type YW 531 can

- cross a 2.0-meter trench.
- mount a 0.6-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type YW 531 has one layer of armament that consists of a single 12.7-mm heavy machine gun that has a basic load of 1,120 rounds.

(6) Countries Served. The Type YW 531 is in service with the following countries.

Albania	Iraq	Sudan	Vietnam
China	Korea, North	Tanzania	Zaire

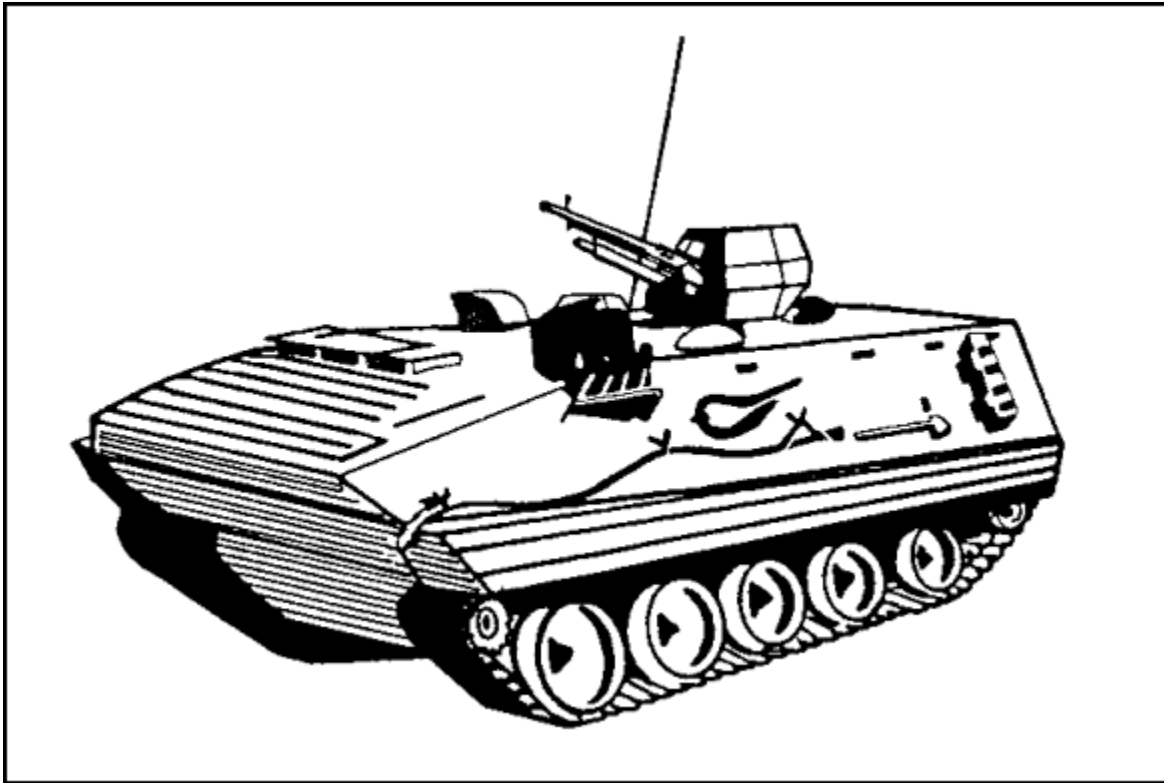


Figure 2-16. Chinese Type YW 534 APC.

n. Type YW 534 APC (China) ([Figure 2-16](#)). The Type YW 534 APC is believed to be the successor to the older Type YW 531 series of full-tracked vehicles. The Type YW 534 is almost identical to the Type 85 (Type YW 531 H APC (9V)) but the latter has a slightly shorter and narrower hull.

(1) Variants. Two variations of the Type YW 534 are presented in the following two paragraphs.

(a) YW 307 IFV. This version is essentially the Type YW 534 with a one-man turret, an external-mounted 25-mm cannon, a 7.62-mm machine gun and smoke dischargers. The basic ammunition load is 400 rounds of 20-mm and 1,000 rounds of 7.62mm ammunition. The YW 307 is similar to the type YW 534 except that it has a combat weight of 15,400 kg and carries seven troops plus its crew of three.

(b) ATGW Carrier. This anti-tank guided weapons carrier is believed to be based on the Type YW 534 series of APCs; although it could just as well be based on the Type 85 (YW 531 H) series. On top of the raised rear hull is a turret with four Red Arrow 8 ATGWs in the ready to launch position. Additional missiles are carried in reserve in the hull. The same turret has been fitted to the YW 531 series of vehicles.

(2) Recognition Features. The Type YW 534 has

- a torsion-bar suspension with each side having five dual rubber-tired road wheels, a drive sprocket at the front, idler at the rear and track return rollers.
- an engine compartment to the right of the driver with the air-inlet and air-outlet louvers in the roof and the exhaust outlet on the right side.
- a driver's left-opening single-piece hatch cover and three forward-facing periscopes, one of which can be replaced by an infrared device for night driving.
- a commander's single-piece hatch cover with an integral vision device.
- a large troop compartment door at the rear where that has a vision block and firing port.
- a single circular roof hatch on each side in the forward part of the troop compartment roof.
- two oblong roof hatches to the rear of the 12.7mm machine gun installation.
- a bank of four smoke dischargers mounted on each side of the forward part of the hull.
- a 12.7-mm machine gun that has no overhead protection for the gunner.
- two firing ports and periscopes in the left side of the hull and three or four firing ports and periscopes in the right side. The firing ports are fitted with ball and socket type mountings for rifles. (Other vehicles have been seen with three firing ports and periscopes in the left side and four in the right.)
- a trim vane that is erected at the front of the vehicle before it enters the water.

(3) Vehicle Characteristics. The Type YW 534 has an all-welded hull and is fully amphibious, being propelled through the water by its tracks. The driver sits at the front of the vehicle with the commander to his rear. Specifications for the Type YW 534 are provided in the lists and paragraphs that follow.

#### Type YW 534 Measurements

<u>Crew</u> , 2.	<u>Ground clearance</u> , 0.48 meters.
<u>Passengers</u> , 13.	<u>Track</u> , 2.626 meters.
<u>Combat weight</u> , 14,300 kg.	<u>Track width</u> , 360 mm.
<u>Length</u> , 6.15 meters.	<u>Track length</u> , 3.425 meters.
<u>Width</u> , 3.134 meters.	<u>Maximum road speed</u> , 65 km/h.
<u>Hull height</u> , 1.88 meters.	<u>Maximum water speed</u> , 6 km/h.
<u>Height over turret</u> , 2.556 meters.	<u>Maximum range</u> , 500 km.

(4) Vehicle Capabilities. The Type YW 534 can

- cross a 2.5-meter trench.
- mount a 0.7-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type YW 534 has a 12.7-mm heavy machine gun with a load of 1,100 rounds.

(6) Countries Served. The Type YW 531 is in service with the following countries.

Albania  
China

Iraq  
Korea, North

Sudan  
Tanzania

Vietnam  
Zaire

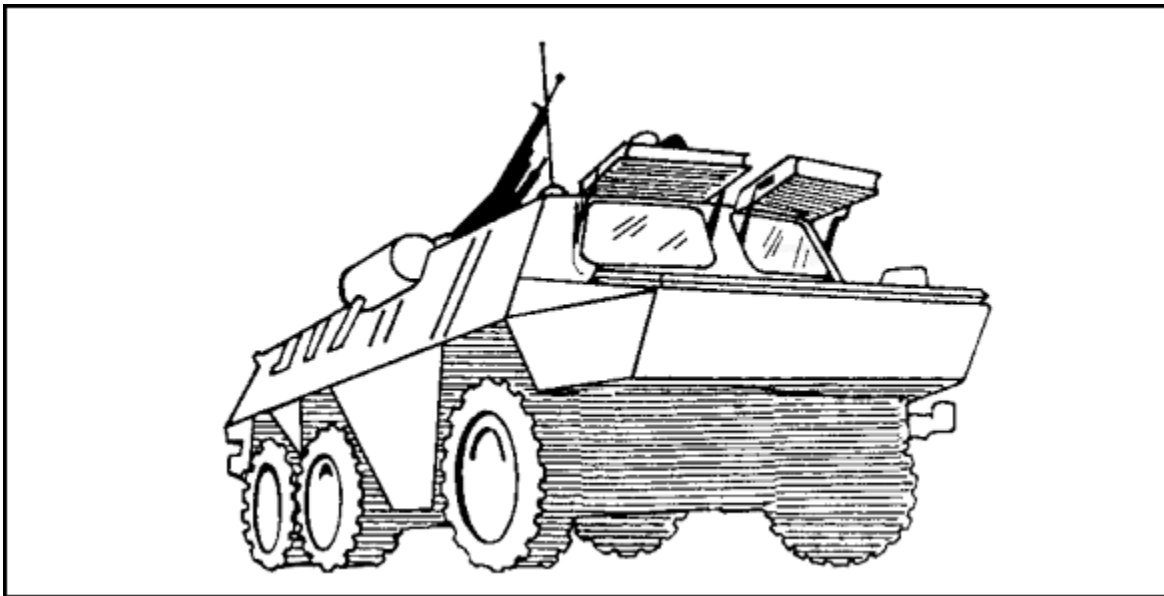


Figure 2-17. Chinese Type WZ 523 APC with 12.7-mm Machine gun.

o. Type WZ 523 APC (China) ([Figure 2-17](#)). The Type WZ 523 first appeared in 1984 and is similar to the Belgian SIBMAS and South African Ratel APCs. The Type WZ 523 may be based on a motor vehicle or tractor (6 x 6) chassis and may use automotive components. The US Army refers to the Type WZ 523 as the M1984.

(1) Variants. Variations of Type WZ 523 are probably under development and could include a command post, ambulance, mortar carrier and an anti-tank vehicle with missiles.

(2) Recognition Features. The Type WZ 523 has

- six drive wheels (6 x 6).

- an engine compartment in the center, probably offset to allow for full crew movement within the vehicle.
- front wheel steering only.
- an exhaust outlet on the right side of the hull.
- two large bullet-proof drive windows, which would be covered in combat by an armored shutter hinged at the top.
- a single-piece hatch cover above the commander and driver, hinged in the center, which can be locked vertically.
- a door in the right side of the hull, to the rear of the first road wheel.
- a troop compartment at the rear where troops enter and exit through a large door that is hinged on the right with a single circular firing port.
- rectangular roof hatches above the troop compartment that open outward.
- two observation/firing hatches in each side that open upwards.
- a 12.7-mm Type 54 machine gun with lateral protection on the hull roof, slightly forward of the troop compartment.
- a trim vane that is erected at the front of the hull before entering the water.
- a single firing port in each side of the hull.

(3) Vehicle Characteristics. The Type WZ 523 probably has an all-welded armored hull. The vehicle is fully amphibious, being propelled through the water by two water jets at the rear of the hull. The commander and driver sit at the front of the vehicle. The commander probably sits at the right and the driver to the left. Specifications for the Type WZ 523 are provided in the lists and paragraphs that follow.

#### Type WZ 523 Measurements

Crew, 2.

Passengers, 10.

Configuration, (6 x 6).

Combat weight, 11,200 kg.

Length, 6.02 meters.

Width, 2.55 meters.

Height overall, 2.73 meters.

Maximum road speed, 80 km/h.

Maximum water speed, 7 km/h.

Fuel capacity, 255 liters.

Maximum road range, 600 km.

(4) Vehicle Capabilities. The Type WZ 523 can

- climb a 60-percent grade.
- climb a 30-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type WZ 523 has one layer of armament that consists of a single 12.7-mm heavy machine gun that has a basic load of 600 rounds.



(6) Countries Served. The Type WZ 523 is in service with the Chinese Army.

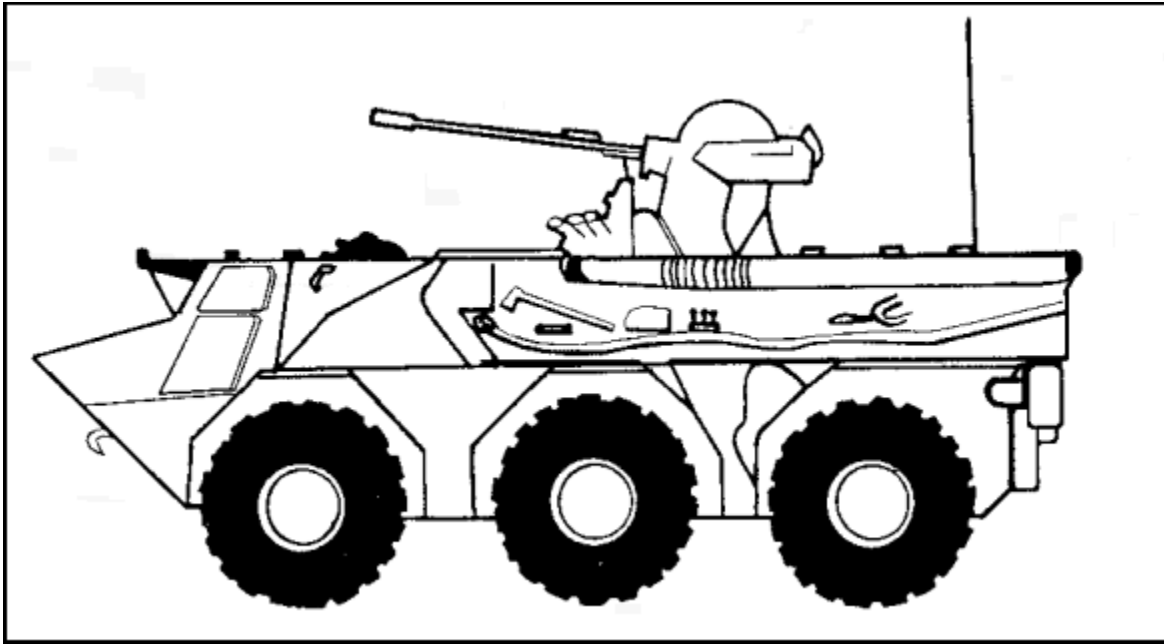


Figure 2-18. Type WZ 551 with 25-mm cannon and 7.62-mm MG.

p. Type WZ 551 APC (China) ([Figure 2-18](#)). The Type WZ 551 first appeared in 1986. This new family of vehicles will be capable of being used for a wide range of roles, including 82-mm and 120-mm mortar carriers, and be armed with a wide range of weapons, including a 12.7-mm machine gun, 25-mm cannon, 90-mm or 105-mm guns. The vehicle is similar in appearance to the French VAB (6 x 6) but has a number of important differences as well as being longer, wider and heavier.

(1) Variants. A number of Type WZ 551 variations have been observed and are presented in the following subparagraphs.

(a) 12.7-mm APC (6 x 6). This is the basic version discussed in this lesson.

(b) Ambulance (6 x 6). This version has a raised rear troop compartment, a crew of three and can carry four stretchers. Mounted on the forward part of the roof is a cupola with an externally-mounted 12.7-mm machine gun for which 500 rounds of ammunition are carried.

(c) 73-mm IFV (6 x 6). This version has a turret that is similar to the Soviet BMP-1 vehicle. Armament on this version consists of a 73-mm gun with a load of 40 rounds, a 73-mm Red Arrow 73 ATGW mounted over the main armament for which four missiles are carried and a coaxial 7.62-mm machine gun with a load of 2,000 rounds.

(d) 25-mm IFV (6 x 6). This version has a crew of two and is fitted with a one-man operated turret on the roof to the immediate rear of the engine compartment.

To the rear of the turret are two rectangular roof hatches. A 25-mm cannon is mounted externally with a 7.62-mm machine gun mounted coaxially to its left. Smoke dischargers are located on each side of the lower part of the turret. The gunner has a single-piece hatch cover that opens to the right and two periscopes and a day/night sight mounted in the forward part of the turret roof. The 25-mm cannon can fire single shots or rates of fire of 100, 300 or 500 rds/min. Two hundred rounds of ready use 20-mm ammunition are carried plus a further 200 rounds in reserve. One thousand rounds of 7.62-mm ammunition are carried.

(e) Type NGV-1 Infantry Fighting Vehicle (6 x 6). This NGV-1 is essentially the WZ 551 (6 x 6) fitted with a French GIAT Dragar one-man power operated turret. In addition to being armed with a 25-mm GIAT M811 cannon, it is also armed with a 7.62-mm machine gun and two banks of three smoke dischargers.

(f) Anti-tank Vehicle (4 x 4). This version is fitted with a one-man turret with four Red Arrow 8 ATGWs ready to launch; an additional eight missiles are carried in reserve.

This version has a crew of four. As an alternative the 4 x 4 version can be fitted with the one-man turret armed with the 73mm gun, 7.62-mm machine gun and Red Arrow 73 ATGW.

This vehicle has a weight of 12,500 kg, a length of 6.05 meters, a width of 2.8 meters, a height to the top of the hull of 1.95 meters and to the launcher, 2.6 meters, a wheelbase of 3.2 meters and a maximum road speed of 85 km/h with a range of 600 km.

(g) 122-mm SPH (8 x 8). This vehicle is based on a lengthened 6 x 6 chassis. Mounted on the hull top at the rear is a turret armed with a 122-mm howitzer for which 40 rounds of ammunition are carried. Before firing, two spades can be lowered at the rear of the hull to provide a more stable firing platform.

The 122-mm SPH has a weight of 20,000 kg, a length of 7.9 meters, a width of 2.8 meters, an overall height of 2.7 meters and to the hull top, 1.75 meters, a wheelbase of 1.75 + 2 + 1.3 meters, a maximum road speed of 85 km/h with a range of 500 km. This vehicle can also cross a 2-meter trench and climb a 60-percent grade.

(2) Recognition Features. The Type WZ 551 has

- six drive wheels (6 x 6).
- air inlet and outlet louvers in the roof on the engine compartment with the exhaust pipe running along the upper left side of the hull.
- a commander's and driver's windscreen to the front, which would be covered in combat by an armored shutter hinged at the top. When the shutter is lowered,

forward observation is conducted with three roof-mounted periscopes, the center one of which can be replaced by an infrared night vision device.

- a rear-opening circular roof hatch and a forward-opening side door for both the commander and driver in the upper part of which is an armored shutter.
- a troop compartment at the rear where troops enter and exit through a large door that is hinged on the right and has a firing port and a vision block.
- four oblong roof hatches, two on each side, above the troop compartment; they are hinged on the outside and can be locked vertical if required.
- in each side of the troop compartment, four firing ports with a periscope mounted above in the roof of the vehicle. The first firing port in each side is for a 7.62-mm machine gun with the remaining three being for assault rifles.
- a gas extractor for each firing port.
- fuel tanks located on each side of the troop compartment.
- a trim vane that is erected at the front of the hull before entering the water.
- on at least one prototype, a door in the lower half of the hull between the first and second wheels that is used for vehicle maintenance.

(3) Vehicle Characteristics. The Type WZ 551 has an all-welded armored hull. The vehicle is fully amphibious, being propelled through the water by two shrouded propellers mounted one each side under the rear of the vehicle. These are swung backwards when in the water. The engine compartment is to the rear of the driver's compartment. The commander and driver sit at the front of the vehicle with the commander at the right, driver to the left and the gunner behind the commander. Specifications for the Type WZ 551 fitted with a one-man turret are provided in the lists and paragraphs that follow.

#### Type WZ 551 Measurements

Crew, 2.

Passengers, 9.

Configuration, (6 x 6).

Combat weight, 15,000 kg.

Length, 6.65 meters.

Width, 2.8 meters.

Height to top of hull, 1.95 meters.

Height over 25-mm turret, 2.89 meters.

Ground clearance, 0.41 meters.

Track, 2.44 meters.

Wheelbase, 1.9 + 1.9 meters.

Maximum road speed, 85 km/h.

Maximum water speed, 7 km/h.

Maximum road range, 600 km.

(4) Vehicle Capabilities. The Type WZ 551 can

- cross a 1.2-meter trench.
- mount a 0.5-meter vertical step.
- climb a 60-percent grade.
- climb a 30-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type WZ 551 has two layers of armament: main and secondary.

(a) Main Armament. Main armament on the Type WZ 551 is a 25-mm cannon with an ammunition load of 400 rounds.

(b) Secondary Armament. Secondary armament on the Type WZ 551 is a 7.62-mm machine gun with an ammunition load of 1,000 rounds.

(6) Countries Served. Type WZ 551 prototypes are undergoing trials and are not yet in service.

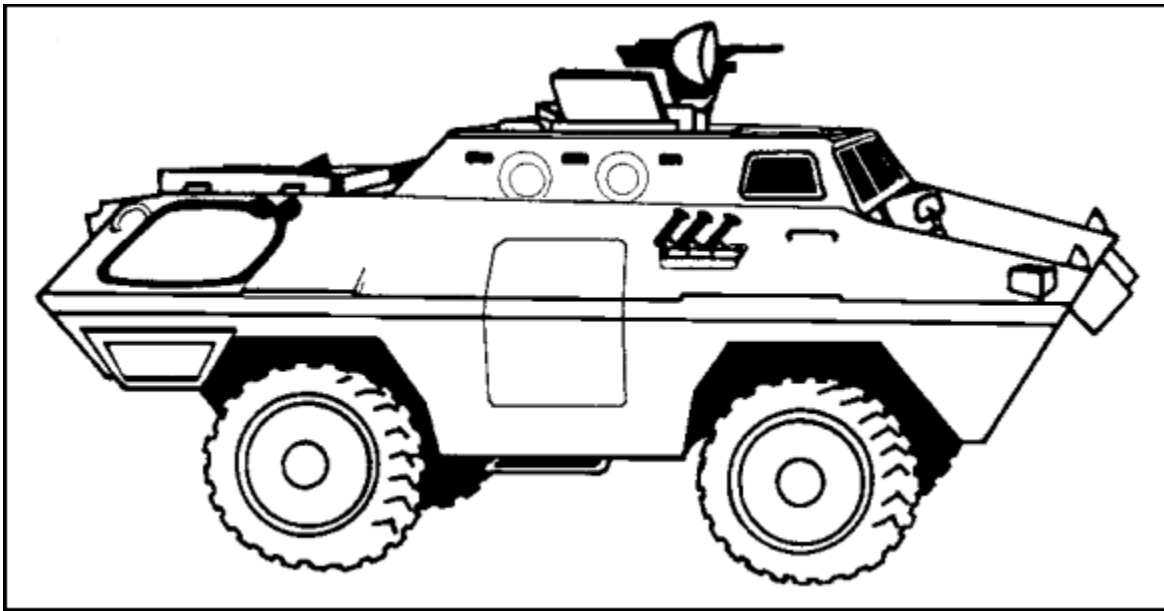


Figure 2-19. BOV-M WAPC (Yugoslavian Militia).

q. BOV Wheeled Armored Personnel Carrier ([Figure 2-19](#)). The BOV is a new family of 4 x 4 wheeled armored fighting vehicles developed in the early 1980s in Yugoslavia.

(1) Variants. Three BOV variants are presented in the following subparagraphs:

(a) BOV-1 ATGW carrier. Mounted on the roof of this version are two pods containing six ATGWs based on the Soviet AT-3 Sagger but fitted with a semi-automatic guidance system. Additional missiles are carried under armor protection within the hull. Maximum rate of fire is two missiles a minute.

Between the two pods of missiles, a 7.62-mm machine gun is mounted. Both the BOV-1 ATGW and the two SPAAG chassis are slightly different to the APC as they do not have the raised troop compartment roof.

(b) BOV-3 SPAAG. This version is fitted with a power operated turret armed with three 20-mm cannon, each of which has a drum-type magazine holding 60 rounds of ammunition with a total of 1,500 rounds of ammunition being carried. The BOV-3 is a clear weather system only.

(c) BOV-30 SPAAG. First seen in 1985, this is the latest SPAAG version. It is fitted with a larger enclosed turret armed with twin 30-mm cannon. Two three barrelled smoke discharges are mounted on each side of the turret.

(2) Recognition Features. The BOV has

- a 4 x 4 capability.
- an engine compartment at the rear of the hull with air-inlet and air-out louvers on the top of the roof and an engine access door at the rear.
- both a driver's and commander's rear-opening single-piece hatch cover.
- a driver's single forward-facing periscope in the roof which can be replaced by a passive periscope.
- a bullet proof window covered by a wire mesh screen immediately in front and on each side of the commander and driver.
- a single troop entry/exit door in each side that opens towards the front.
- three firing ports, each with an associated firing port, each side of the troop compartment and an additional firing port to the right of the commanders windscreen.
- windows in the rear of the troop compartment.
- a cupola with a two part roof hatch that opens left and right mounted over the top of the troop compartment. An externally-mounted 7.62-mm machine gun and a searchlight is mounted to the cupola.
- a bank of three forward-firing smoke dischargers each side of the hull.
- a wire mesh screen on each side of the forward part of the hull that lays alongside the hull when travelling and is swung out through 90 degrees when required, for example: in a riot situation.

(3) Vehicle Characteristics. The BOV has no amphibious capability and the hull of the vehicle is of all-welded steel construction. The driver is seated at the front of the vehicle on the left with the commander seated to his right. The gunner is one of the assigned troops (passengers). Specifications that apply to the basic BOV WAPC are provided in the lists and paragraphs that follow.

## BOV Measurements

Crew, 2 + 8.

Configuration, 4 x 4.

Combat weight, 5,700 kg.

Length, 5.70 meters.

Width, 2.534 meters.

Height with screens, 2.92 meters.

Height to hull roof, 2.335 meters.

Ground clearance, 0.325 meters.

Track, 1.90 meters.

Wheelbase, 2.75 meters.

Maximum speed, 95 km/h.

Fuel capacity, 220 liters.

Range, 500 to 800 km.

(4) Vehicle Capabilities. The BOV can

- cross a 0.64-meter trench.
- mount a 0.54-meter vertical step.
- climb a 55-percent grade.
- climb a 30-percent side slope.
- ford 1.1 meters.

(5) Armament Characteristics. The BOV has one layer of armament: a 7.62-mm machine gun.

(6) Countries Served. The BOV Wheeled Armored Personnel Carrier is in service with the Yugoslavian Army and Militia.

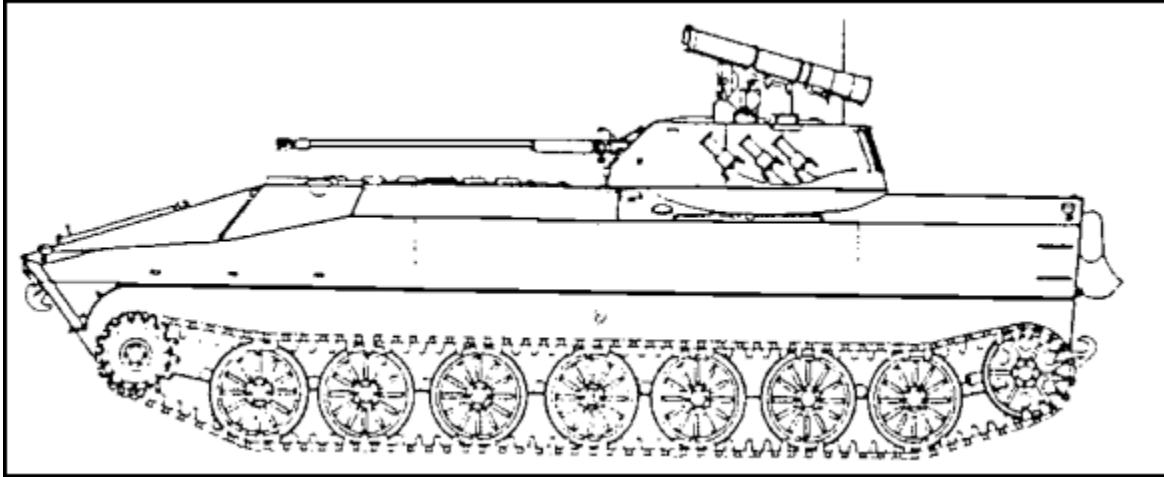


Figure 2-20. Bulgarian APC with 30-mm cannon and AT-5 Spandrel.

r. New Armored Personnel Carrier (Figure 2-20). First observed in 1984, this new vehicle consists of the chassis of the Soviet 122-mm SO-122 (2S1) self-propelled howitzer fitted with the complete turret of the new Soviet BMP-2 infantry combat vehicle. The new vehicle is armed with a 30-mm cannon, 7.62-mm coaxial machine gun and a Spandrel anti-tank guided missile. Most sources believe that this new vehicle is an armored personnel carrier; although it could also be a reconnaissance vehicle. No specifications for it have been revealed but the combat weight is probably about 15,000 kg and in addition to its crew of three, commander, gunner and driver, 8 to 12 infantrymen can be carried. The vehicle is in production and service in Bulgaria.

#### 4. Amphibious Reconnaissance Vehicles (ARVs).

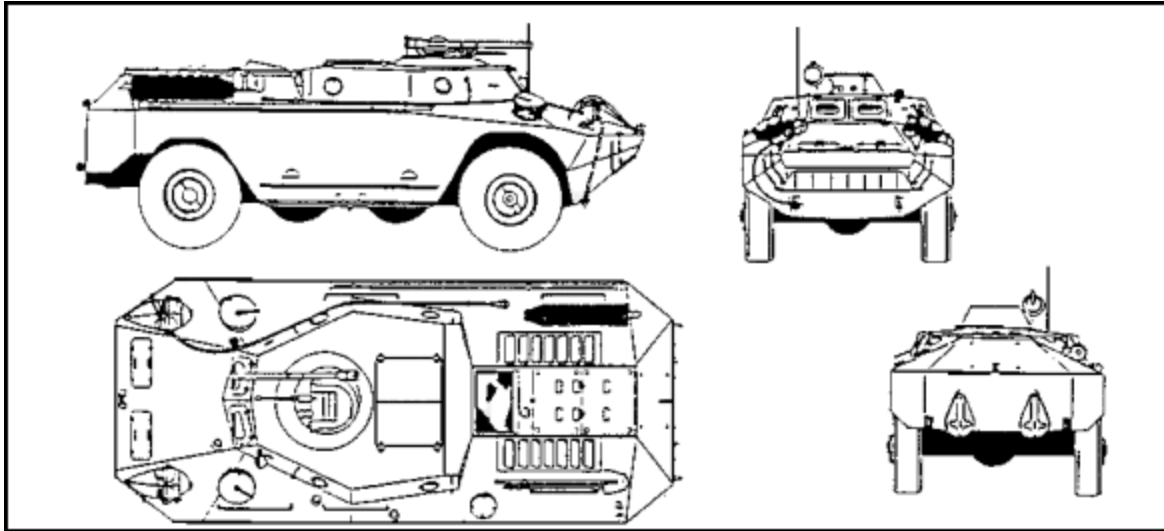


Figure 2-21. FUG/OT-65 Amphibious Reconnaissance Vehicle (ARV).

a. FUG/OT-65 (Czechoslovakia/Hungary/Poland) ([Figure 2-21](#)). The FUG/OT-65 ARV is similar to the Soviet BRDM-2 discussed later in this lesson. However, several differences reflect an independence of design. It has two waterjet ports for amphibious propulsion instead of one as is found on the BDRM-2. Like the BDRM-2, it has two auxiliary belly wheels on each side which the driver can lower to assist the vehicle in crossing obstacles and gaps. Speed is sacrificed in this mode of travel, which is accomplished in first gear at a speed of five to eight kilometers per hour.

(1) Variants. Two FUG/OT-65 variants are discussed below.

(a) FUG/OT-65A. This version has a miniturret with an external 82-mm recoilless gun and an internal 7.62-mm machine gun. Rate of fire for the 82-mm gun is one or more rds/min (dependent on availability of outside loader) with a load of five to ten rounds. A practical rate of fire for the 7.62-mm gun is 200 rds/min with a load of 1,000 to 2,000 rounds.

The Hungarian reconnaissance vehicle version normally carries only a 7.62-mm light machine gun. The machine gun is unmounted but can be placed in a pintle mount on the vehicle.

(b) FUG/OT-65RKh. This version is fitted with a dispenser for radiological-chemical contamination marking flags.

(2) Recognition Features. The FUG/OT-65 has

- a (4 x 4) truck chassis with four retractable powered auxiliary wheels.
- an engine situated in the rear.
- a troop compartment in the center of the hull.

- no partition between the driver and troop compartment.
- two waterjet propulsion units at the rear.
- two waterjet port covers at the rear.

(3) Vehicle Characteristics. The FUG/OT-65 is fully amphibious. Specifications for the FUG/OT-65 are provided in the lists and paragraphs that follow.

#### FUG/OT-65 Measurements

<u>Crew</u> , 2 (plus a gunner in the FUG/OT-65A).	<u>Height</u> , 1.91 meters.
<u>Passengers</u> , 4.	<u>Wheelbase</u> , 3.3 meters.
<u>Combat weight</u> , 7,000 kg.	<u>Maximum speed</u> , 80 km/h.
<u>Length</u> , 5.79 meters.	<u>Maximum water speed</u> , 9 km/h.
<u>Width</u> , 2.50 meters.	<u>Fuel capacity</u> , 200 liters.
<u>Ground clearance</u> , 0.34 meters.	<u>Maximum range</u> , 600 km.
	<u>Hull armor</u> , 13-mm thick.

(4) Vehicle Capabilities. The FUG/OT-65 can

- cross a 1.2-meter trench.
- climb a 32 degree slope.
- ford amphibiously.

(5) Armament Characteristics. The FUG/OT-65 ARV basic vehicle has no fixed armament. The FUG/OT-65A variant has two layers of armament, which is discussed above under subparagraph (1) Variants.

(6) Countries Served. The FUG/OT-65 ARV is in service with the Czechoslovakian, Hungarian and Polish Armies.



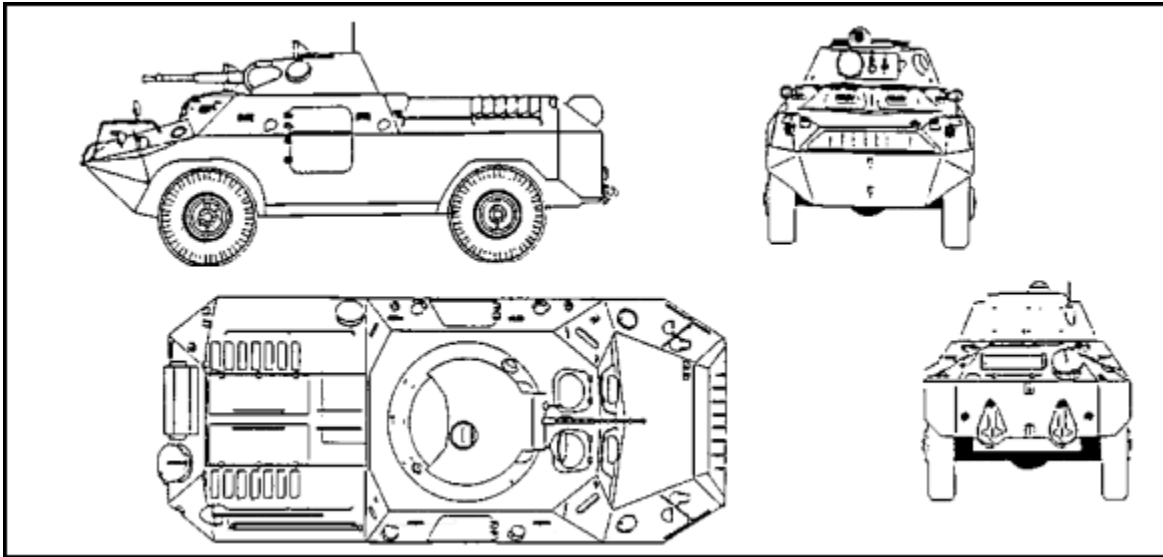


Figure 2-22. PSzH-IV/FUG-70 (ARV).

b. PSzH-IV/FUG-70 ARV (Hungary) ([Figure 2-22](#)). The PSzH is a modified version of the FUG/OT-65. The PSzH mounts a 14.5-mm and a 7.62-mm machine gun in the same turret used on Soviet wheeled vehicles of similar usage. It was first observed in 1970 and designated the FUG-70. Other than the addition of the turret and removal of the belly wheels, the vehicle appears to be identical to the FUG/OT-65. It is manufactured in Hungary and used by the Hungarian armed forces and the (East) German Border Command. Other designators for the PSzH are: FUG-D-944, FUG-65B, And FUG-70.

(1) Variants. There are only two versions of the PSzH: the basic reconnaissance vehicle and a command vehicle.

(2) Recognition Features. The PSzH-IV/FUG-70 has

- a (4 x 4) truck chassis and no auxiliary belly wheels.
- an engine situated in the rear.
- a troop compartment in the center of the hull.
- two waterjet propulsion units at the rear.
- two waterjet port covers at the rear.
- turret-mounted 14.5-mm and 7.62-mm machine guns.

(3) Vehicle Characteristics. The PSzH-IV/FUG-70 is fully amphibious, being propelled through the water by two waterjet propulsion units. Specifications for the PSzH-IV/FUG-70 are provided in the lists and paragraphs that follow.

## PSzH-IV/FUG-70 Measurements

<u>Crew</u> , 2.	<u>Height</u> , 2.30 meters.
<u>Passengers</u> , 6 to 7.	<u>Wheelbase</u> , 3.30 meters.
<u>Combat weight</u> , 7,500 kg.	<u>Maximum road speed</u> , 80 km/h.
<u>Length</u> , 5.70 meters.	<u>Maximum water speed</u> , 9 km/h.
<u>Width</u> , 2.50 meters.	<u>Fuel capacity</u> , 200 liters.
<u>Ground clearance</u> , 0.42 meters.	<u>Maximum road range</u> , 700 km.

## PSzH-IV/FUG-70 Armor

<u>Hull</u>	<u>Turret</u>
12 mm	14 mm

(4) Vehicle Capabilities. The PSzH-IV/FUG-70 can

- cross a 0.60-meter trench.
- mount a 0.40 meter step.
- climb a 30 degree slope.
- ford amphibiously.

(5) Armament Characteristics. The PSzH-IV/FUG-70 ARV has two layers of armament: main and secondary.

(a) Main Armament. Main armament consists of a turret-mounted 14.5-mm heavy machine gun. The 14.5-mm gun has a practical rate of fire of 150 rds/min with a basic load of 500 rounds.

(b) Secondary Armament. Secondary armament consists of a 7.62-mm coaxially-mounted machine gun. This gun has a practical rate of fire of 250 rds/min with a basic load of 1,000 to 2,000 rounds.

(6) Countries Served. The PSzH-IV/FUG-70 ARV is in service with Hungary and (East) Germany.

## 5. Amphibious Scout Cars (ASCs).

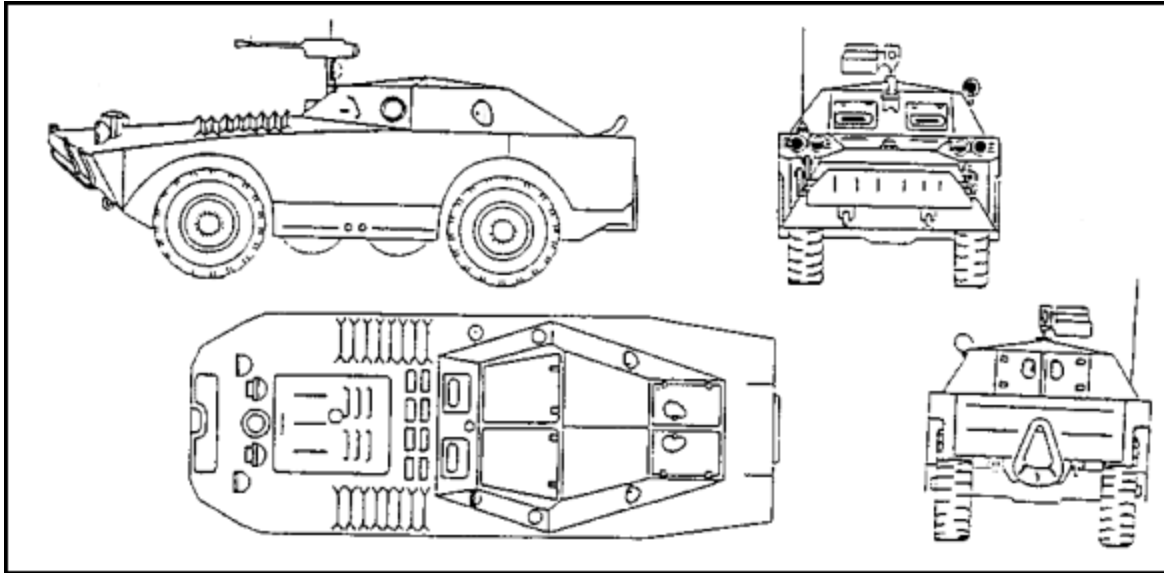


Figure 2-23. Soviet BRDM-1 Amphibious Scout Car (ASC).

a. BRDM-1 ASC (Soviet) ([Figure 2-23](#)). The BRDM-1 ASC first appeared in 1959 and was issued to most Warsaw Pact members where it is now in second-line units or held in reserve. In Soviet front-line units the BRDM-1 has been replaced by the BRDM-2, which has a higher road speed and is fitted with a turret armed with a 14.5-mm and a 7.62-mm machine gun. Weapons on the BRDM-1 are fitted to unprotected mounts. The BRDM Model 1957 has an open roof while the BRDM-1 Model 1958 has a closed roof with twin hatches, this being the standard production model.

(1) Variants. A number of BRDM-1 variants are discussed below.

(a) BRDM-U Command Vehicle. This version can be distinguished from the basic vehicle as it has a radio antenna on each side of the hull and two radio antennas at the rear whereas the basic vehicle has only a single radio antenna on the right side of the hull.

(b) Radiological-Chemical Reconnaissance Vehicle (BRDM-RKh). This version is easily distinguishable from the basic vehicle by two rectangular racks on each side of the hull at the rear that contain lane-marking poles with pennants. The racks are normally covered with canvas and when required are positioned vertically over the rear of the vehicle. The poles are used to mark lanes through contaminated areas.

(c) BRDM-1 with Snapper ATGWs. This system is basically a BRDM-1 vehicle with its superstructure extended to the rear of the hull and carrying a triple launcher for the Snapper AT-1 ATGW. The missiles are mounted under the launcher arms and before the launcher can be raised into the open, the four hatch covers over the missile compartment are swung clear to each side of the hull. The missiles can be launched from within the vehicle or away from it with the aid of

a separation sight. As far as it is known, this model is no longer in front-line service with Soviet Union.

(d) BRDM-1 with Swatter ATGWs. This model is similar to the previous model but has a quadruple rather than a triple launcher with the missiles being mounted above the long launcher rails. In addition to the hatch covers that open on each side of the vehicle there is also a cover that opens to the rear of the launcher. This model has been seen in service only with Soviet units and is believed to be no longer in front-line service.

(e) BRDM-1 with Sagger ATGWs. This model has a sextuple launcher that is raised in the launch position complete with the overhead cover. The missiles can be launched from inside the vehicle or up to 80 meters away from it with the aid of a separation sight. It is believed that this model is no longer in front-line service with the Soviet Army, having been replaced by Sagger ATGW systems on a BRDM-2 chassis.

(2) Recognition Features. The BRDM-1 has

- a (4 x 4) truck chassis with two retractable rough terrain belly wheels on each side between the front and rear wheels for improved cross-country and ditch crossing performance.
- a forward mounted engine.
- driver and commander hatch covers that are hinged at the top and open forward. The hatch covers have vision blocks for when the hatch is closed.
- a windscreen and wiper blade.
- a troop compartment toward the rear of the vehicle.
- a vision slit protected by a vision block to the left of the driver and right of the commander.
- two firing ports in each side of the hull.
- two large rear-opening hatches in the forward part of the roof.
- a crew compartment that slopes at an angle of about 30 degrees and is fitted with a two-piece hatch that opens on each side of the superstructure. There is a firing port in each hatch.
- a single waterjet propulsion unit at the rear.
- a single waterjet port cover at the rear.
- a trim board that is folded and stowed under the nose of the vehicle when not in use and erected at the front of the hull before entering the water.
- a white searchlight mounted on the left side of the hull.

- a communications reel and wire mounted on the left side of the superstructure towards the rear.
- a 12.7-mm machine gun and/or a 7.62-mm SGMB machine gun. (Some vehicles are fitted with a 12.7-mm DShKM heavy machine gun mounted at the forward part of the roof with a 7.62-mm SGMB machine gun being mounted at the rear.)

(3) Vehicle Characteristics. The BRDM-1 is made of allwelded steel with the engine at the front and the crew compartment at the rear. The driver is seated at the front of the vehicle on the left with the commander to his right. The BRDM-1 is fully amphibious, being propelled through the water by a single waterjet at the rear of the hull. Specifications for the BRDM-1 are provided in the lists and paragraphs that follow.

#### BRDM-1 Measurements

Crew, 5 (Snapper, Swatter and Sagger variants have 2-3).

Passengers, 3.

Configuration, 4 x 4.

Weight unloaded, 5,600 kg.

Length, 5.7 meters.

Width, 2.25 meters.

Height, 1.9 (Swatter and Sagger, 2) meters.

Ground clearance, 0.315 meters.

Track, 1.6 meters.

Wheelbase, 2.8 meters.

Maximum speed, 80 km/h.

Maximum water speed, 9 km/h.

Fuel capacity, 150 liters.

Maximum range, 500 km.

Hull armor, 10-mm thick.

(4) Vehicle Capabilities. The BRDM-1 can

- cross a 1.22-meter trench.
- mount a 0.4-meter vertical step.
- climb a 60-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The BRDM-1 ASC has three layers of armament: main, secondary and supplemental. Some BRDM-1s have a 12.7-mm machine gun, pintle-mounted on the forward part of the roof as main armament, with a 7.62-mm machine gun mounted at the rear as a secondary weapon. Other versions are fitted with only a 7.62-mm machine gun. The 12.7-mm gun has a practical rate of fire of 80 to 100 rds/min with a load of 500 rounds. The 7.62-mm machine has a basic load of 1,250 rounds. Supplementary armament for the BRDM-1 consists of Snapper, Swatter and Sagger ATGWs discussed above under subparagraph (1).

(6) Countries Served. The BRDM-1 Amphibious Scout Car is in service with the following countries.

Albania	Cuba	Guinea	Soviet Union
Algeria	Czechoslovakia	Mozambique	Sudan
Angola	Ethiopia	Poland	Yugoslavia
Bulgaria	Germany, (East)	Romania	Zambia
Congo			

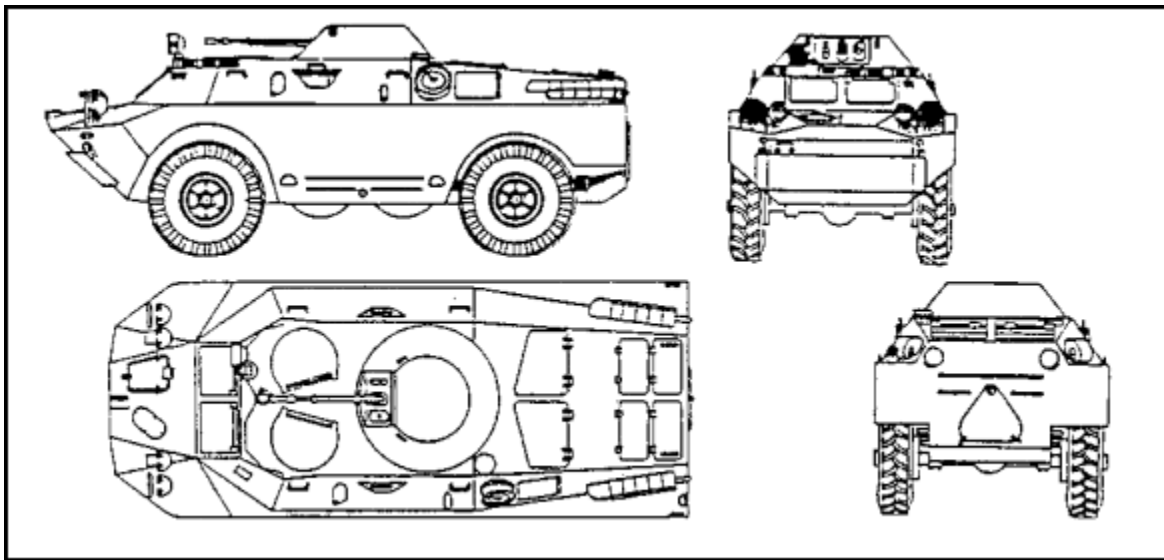


Figure 2-24. Soviet BRDM-2 Amphibious Scout Car (ASC).

b. BRDM-2 ASC (Soviet) ([Figure 2-24](#)). The BRDM-2 was designed as the successor to the earlier BRDM-1. Main improvements over the earlier BRDM-1 vehicles are the BRDM-2s fully-enclosed armament installation and more powerful rearmounted engine. These improvements give the BRDM-2 a higher road clearance and better cross-country and water performance. Externally it differs from the BRDM due to its larger, box-like hull. You have to be careful not to confuse the BRDM-2 with the Hungarian FUG (OT-65) and FUG-70 amphibious scout cars which also have rear engines. The distinguishing difference is the twin water jets of the Hungarian vehicles as compared to the single triangular water jet of the Soviet scout car.

(1) Variants. A number of BRDM-2 variants are presented in the following subparagraphs:

- (a) BRDM-2U Command Vehicle. This version has its turret replaced by a hatch that opens forward. Mounted to the rear of this hatch is a communications equipment generator. Two radio antennas are mounted one each side of the hull.
- (b) BRDM-2-RKh Radiological-Chemical Reconnaissance Vehicle. This version has two rectangular racks on each side of the hull at the rear that contain lane-marking poles with pennants. The racks are normally covered with canvas and

when required are positioned vertically over the rear of the vehicle. The poles are used to mark lanes through contaminated areas. There are two versions of this vehicle: the original RKha with the standard 14.5-mm KPVT heavy machine gun and the more usual RKhb with twin 7.62-mm machine guns and improved sensors.

(c) BRDM-2 with Swatter-C ATGWs. This version is similar in appearance to the BRDM-2 with the Sagger ATGW. However, it has a quadruple launcher for the AT-2 ATGW and was converted from its original radio command-to-line-of-sight guidance to semi-active infrared/command guidance. A total of eight Swatters is carried including the three in the ready to launch position. As far as is known the improved Swatter has been fitted to the original BRDM-1 installation.

(d) BRDM-2 with Sagger ATGWs. This version is a BRDM-2 with its turret replaced with an arm, on top of which are mounted six Sagger AT-3 ATGWs. When travelling the ATGWs are within the hull. In combat, they are raised along with their overhead armor protection, above the top of the hull. The missiles can be launched from within the vehicle or up to 80 meters away. A total of eight missiles are carried in reserve and a radio antenna is fitted at the rear on the right side.

(e) BRDM-2 with Spandrel (AT-5) ATGWs. This version is fitted with a turret on top of which is mounted five ready to launch missiles. This vehicle is sometimes referred to as the BRDM-3. To the rear of the turret in the top of the hull is a bowed hatch, which is thought to fold into the hull, enabling the launcher to be internally reloaded. The launch tube has a blow-out cap at the front and is flared at the rear and a sight is fitted in the roof of the vehicle on the right side. It is estimated that ten more missiles are carried inside the hull.

In (East) Germany, it has been observed that the outer launch position has been fitted with AT-4 Spigot ATGWs. This arrangement allows an increased missile load, believed to be six AT-5 Spandrels plus eight AT-4 Spigots rather than 10 AT-5s.

(f) SA-9 (Gaskin) System. The SA-9 (Gaskin) mobile surface-to-air missile system is based on a modified BRDM-2 (4 x 4) amphibious chassis with its belly wheels removed. The original turret has been replaced by a one-man turret with an elevating arm on each side. Mounted to each arm is a box-type launcher for the SA-9 fire-and-forget missiles. In the Soviet Army and some other countries, the SA-9 is being replaced by the SA-13 Gopher SAM system on a modified MT-LB chassis. To reduce the overall height of the system for travelling, the missiles are normally lowered into the horizontal position on each side of the vehicle. No reserve missiles are carried on the SA-9 system.

(g) BRDM-2 Anti-tank Guided Missile (ATGM) Launcher. This version is used for the AT-2/Swatter, AT3/Sagger, and AT-5/Spandrel. The AT-5 launcher can also fire the AT-4/SPIGOT missile. The ATGM launcher replaces the turret.

(2) Recognition Features. The BRDM-2 has

- a 4 x 4 truck chassis with two retractable rough terrain chain driven belly wheels on each side of the vehicle between the front and rear wheels.
- tires that are not protected by armor and are particularly vulnerable to puncture by all kinds of fire.
- a rear-mounted engine with a short stubby hood.
- a troop compartment in the center of the hull.
- no roof hatch on the turret.
- a cruciform-shaped back with one waterjet cover that has a straight horizontal bottom.
- a bulletproof windscreen to the front of the driver and commander. An armored shutter hinged at the top covers the windscreen when the vehicle is in a combat area.
- periscopes mounted at roof level around the front and sides of the driver's and commander's positions.
- two circular roof entry hatches behind the driver and commander.
- a turret mounted in the center of the vehicle that is the same as that mounted on the Soviet BTR-60PB and Czechoslovak OT-64 SKOT-2A armored personnel carriers.
- a single firing port in each side of the hull. Immediately behind each of these firing ports are three vision blocks that protrude from the outside of the hull.
- two air-inlet louvers in the forward engine compartment roof and four smaller air-inlet louvers to the rear.
- exhaust pipes on each side of the hull.
- a trim vane that is stowed under the nose of the hull when travelling and is erected at the front of the hull before entering the water.
- a triangular-shaped waterjet cover plate.
- an air inlet on the hull top, left of the turret. o infrared driving lights.
- an infrared searchlight mounted over the commander's position.
- a winch mounted internally at the front hull.



(3) Vehicle Characteristics. The BRDM-2 has an allwelded steel hull with the engine at the rear. The driver sits at the front of the vehicle on the left with the commander to his right. The BRDM-2 is fully amphibious, being propelled through the water by a single waterjet. Specifications for the BRDM-1 are provided in the lists and paragraphs that follow.

#### Basic BRDM-2 Measurements

<u>Crew</u> , 2 to 5 (Sagger version, 2-3).	<u>Ground clearance</u> , 0.43 meters.
<u>Passengers</u> , up to 4.	<u>Track</u> , 1.84 meters.
<u>Configuration</u> , 4 x 4.	<u>Wheelbase</u> , 3.1 meters.
<u>Combat weight</u> , 7,000 kg.	<u>Maximum speed</u> , 100 km/h.
<u>Length</u> , 5.75 meters.	<u>Maximum water speed</u> , 10 km/h.
<u>Width</u> , 2.35 meters.	<u>Fuel capacity</u> , 290 liters.
<u>Height overall</u> , 2.31 (Sagger, 2.01) meters.	<u>Maximum range</u> , 750 km.
<u>Firing height</u> , 2.13 (Sagger, n/a) meters.	

#### Basic BRDM-2 Armor

<u>Hull front upper</u> , 5 mm.	<u>Hull top</u> , 7 mm.
<u>Hull front lower</u> , 7 mm.	<u>Hull belly front</u> , 2 mm.
<u>Hull nose plate</u> , 14 mm.	<u>Hull belly rear</u> , 3 mm.
<u>Hull side upper</u> , 7 mm.	<u>Turret front</u> , 7 mm.
<u>Hull side lower</u> , 7 mm.	<u>Turret sides</u> , 7 mm.
<u>Hull rear upper</u> , 7 mm.	<u>Turret rear</u> , 7 mm.
<u>Hull rear lower</u> , 7 mm.	<u>Turret top</u> , 7 mm.

(4) Vehicle Capabilities. The BRDM-2 can

- cross a 1.25-meter trench.
- mount a 0.4-meter vertical step.
- climb a 60-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The BRDM-2 ASC has two layers of armament: main and secondary.

(a) Main Armament. Main armament is a 14.5-mm KVPT MG with a telescopic sight and an ammunition load of 500 rounds.

(b) Secondary Armament. Secondary armament is a coaxially-mounted 7.62-mm machine gun with an ammunition load of 2,000 rounds.

(6) Countries Served. The BRDM-2 Amphibious Scout Car is in service with the following countries.

Afghanistan	Germany, (East)	Madagascar	Seychelles
Algeria	Djibouti	Malay	Somalia
Angola	Egypt	Mali	Soviet Union
Benin	Equatorial	Mauritania	Sudan
Botswana	Guinea	Mongolia	Syria
Bulgaria	Ethiopia	Morocco	Tanzania
Cape Verde Islands	Guinea	Mozambique	Vietnam
Central African Republic	Guinea-Bissau	Nicaragua	Yemen, South
Chad	Hungary	Peru	Yugoslavia
Congo	India	Poland	Zambia
Cuba	Iraq	Romania	Zimbabwe
	Israel	Sao-Tome and Principe	
	Libya		

## 6. Infantry Combat Vehicles (ICVs).

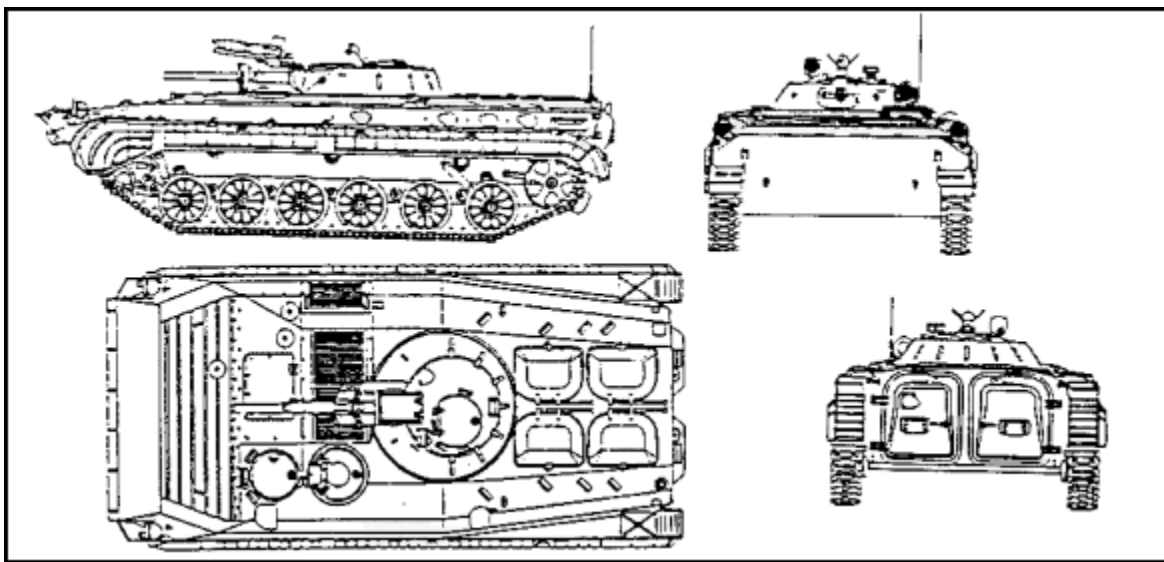


Figure 2-25. BMP Mechanized Infantry Combat Vehicles (ICVs).

a. BMP (Soviet) (Figure 2-25). First introduced in 1967, the BMP represents a transition from the "armored personnel carrier" to the "infantry combat vehicle" in the Soviet and most Warsaw Pact armies. It has replaced the BTR-50P and complements the BTR-60PB in first-line motorized rifle units. Its most noticeable modifications are the lengthening of the bow and the extension of the deflector shroud to the rear. These modifications were designed to improve the BMPs swimming capability, which was inhibited by the forward placement of the engine. Other changes include an enlarged/squared firing port for the PKM machine gun below the turret and repositioned vision blocks above the crew compartment. Many BMPs now mount the improved, semiautomatic AT-3C/SAGGER or the new AT-4/SPIGOT or AT-5/SPANDREL ATGM.

(1) Variants. A number of BMP variants are presented in the following subparagraphs:

(a) BMP-1. This is the basic version.

(b) BMP M-1974 Command Vehicle. This version differs from the BMP-1 mainly by having additional radio equipment and antennas and having the machine gun ports welded shut.

(c) BMP-1KSH. This is a command and staff version.

(d) BMP M-1975 (PRP-3) Artillery Mobile Surveillance Version (SMALL FRED). The M-1975 is easily distinguished from the BMP-1 by an enlarged two-man turret, which has been moved toward the rear and a 7.62-mm machine gun rather than the 73-mm gun and AT-3/SAGGER of the BMP-1. Also, a rectangular folding antenna for the SMALL FRED battlefield surveillance radar is mounted on the rear of the turret. The M1975 carries a five-man crew and extensive radio and optical equipment.

(e) BMP M-1976-1/2 and BMP-R Reconnaissance Vehicles. The BMP M1976 reconnaissance vehicle (also known as the BMP-R) has the same enlarged two-man turret as the M1975 but mounts the standard 73-mm main gun (without the SAGGER launcher). The BMP M1976(2) model has a small parabolic antenna on the roof.

(f) BMP 1978 Command and Communications Vehicle. This version mounts a large telescopic antenna and more radio equipment than the M1974. No armament is mounted in the turret. It is reported to be used by regimental and division staffs.

(g) BMP-PPQ. This is a mobile training version.

(h) BMP-2 (M-1981). The BMP-2 is also known as the M-1981 but will be referred to here exclusively as the BMP-2.

(2) Recognition Features. Recognition features for the BMP-1 and BMP-2 infantry combat vehicles (ICVs) are presented in subparagraphs (a) and (b) below.

(a) BMP-1 Features.

- six stamped, evenly-spaced road wheels with three track support rollers and a front drive sprocket.
- track shields with vertical ribbing cover on the upper portion of track.
- a low-silhouette (boat-shaped) hull with a sloping front and conspicuously ridged surface.
- a ribbed glacis with splash plate hull top.
- two large bulging (fuel containing) entry/exit doors in the rear with a firing port in the left door.

- a exhaust port on the top front right side.
- four large hatches in the roof of the troop compartment to the rear of the turret.
- four firing ports in each side of the troop compartment.
- a driver's hatch at the left front directly in front of the commander's hatch. The commander's hatch mounts an infrared searchlight.
- a one-man conical-shaped turret that mounts a 73-mm smoothbore gun and a 7.62-mm coaxial machine gun.
- a gunner's hatch on the left side of the turret roof.
- a launching rail for SAGGER missiles attached above the 73-mm gun and a short gun tube.

(b) BMP-2 Features.

- six stamped, evenly-spaced road wheels with track support rollers and a front drive sprocket.
- increased armor with modified track skirts with horizontal ribbing the same as BMP-1.
- a low-silhouette (boat-shaped) hull.
- two large bulging (fuel containing) entry/exit doors in the rear with a firing port in the left door.
- a two-man turret with three single tube grenade launchers on the left and four on the right.
- a 30-mm cannon main gun.
- three firing ports on each side of the troop compartment and one firing port at the commander's position.
- a tube-launched AT-5/SPANDREL on the turret (the BPM-1 has a rail-launched AT-3/SAGGER above the gun tube).
- two hatches on top of the troop compartment.

(3) Vehicle Characteristics. The BMP-1 and BMP-2 have all-welded hulls and three-man crews with the driver seated at the front left, the commander to his rear and the gunner at the turret. Both vehicles are amphibious, being propelled through the water by their tracks. Specifications for the BMP-1 and BMP2 are provided in the lists and paragraphs that follow.

## BMP-1 and BMP-2 Measurements

<u>BMP-1</u>	<u>BMP-2</u>
<u>Crew</u> , 3.	<u>Crew</u> , 3.
<u>Passengers</u> , 6 to 8.	<u>Passengers</u> , 7.
<u>Combat weight</u> , 13,500 kg.	<u>Combat weight</u> , 14,300 kg.
<u>Length</u> , 6.74 meters.	<u>Length</u> , 6.858 meters.
<u>Width</u> , 2.94 meters.	<u>Width</u> , 3.13 meters.
<u>Height</u> , 2.15 meters.	<u>Height</u> , 2.75 meters.
<u>Ground clearance</u> , 0.39 meters.	<u>Ground clearance</u> , 0.46 meters.
<u>Maximum speed</u> , 60 km/h.	<u>Maximum speed</u> , 65 km/h.
<u>Maximum water speed</u> , 8 km/h.	<u>Maximum water speed</u> , 7 km/h.
<u>Fuel capacity</u> , 460 liters.	<u>Fuel capacity</u> , 460 liters.
<u>Maximum range</u> , 500 km.	<u>Maximum range</u> , 600 km.

## BMP-1 and BMP-2 Armor

<u>BMP-1</u>	<u>BMP-2</u>
<u>Hull</u> , 19 mm	<u>Hull</u> , 19 mm.
<u>Turret</u> , 23 mm.	<u>Turret</u> , 23 mm.

(4) Vehicle Capabilities. The BMP-1 and BMP-2 can

- cross a 2.00-meter trench.
- mount a 0.80-meter vertical step.
- climb a 30-percent grade (BMP-1) and a 35-percent grade (BMP-2).
- ford amphibiously.

(5) Armament Characteristics. BPM-1 and BPM-2 armament characteristics are presented in paragraphs (a) and (b) below.

(a) BMP-1 Armament. The BMP-1 has three layers of armament: main, secondary and supplemental. Main armament is a 73-mm cannon with a rate of fire of eight rds/min and a basic load of 40 rounds. Secondary armament is a 7.62-mm coaxial gun with a rate of fire of 250 rds/min and a basic load of 2,000 rounds. Supplemental armament is four ATGM AT-3/SAGGER missiles.

(b) BMP-2 Armament. The BMP-2 has two layers of armament: main and supplemental. Main armament is a 30-mm cannon with a rate of fire of 300 to 550 rds/min with a load of 500 rounds. Supplemental armament is four ATGM AT-4/SPANDREL missiles.

(6) Countries Served. BMP Infantry Combat Vehicles are in service with the following countries.

Afghanistan	Egypt	Iran	Poland
Algeria	Ethiopia	Iraq	Soviet Union
Cuba	Finland	Libya	Syria
Czechoslovakia	Hungary	Mongolia	Yugoslavia
Germany, (East)	India	North Korea	

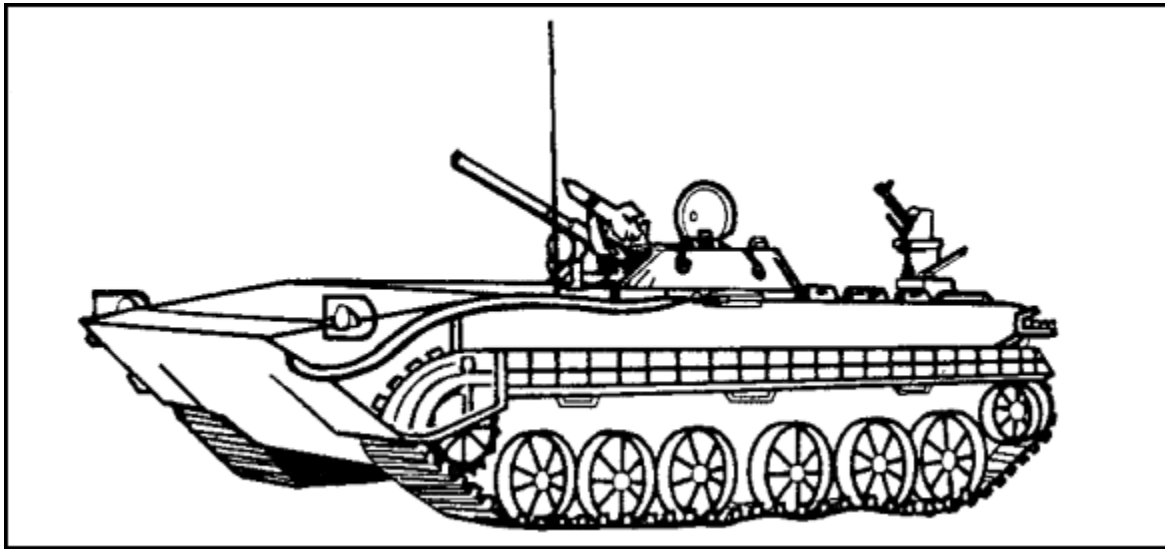


Figure 2-26. Romanian MLI-84 with rear roof-mounted 12.7-mm gun.

b. MLI-84 (Romanian) (Figure 2-26). In appearance and layout the MLI-84 is virtually identical to the Soviet BMP-1 infantry combat vehicle but is slightly larger and heavier and supports additional armament. Some details of the MLI-84 are discussed in the following paragraphs.

(1) Variants. None.

(2) Recognition Features. In addition to the similar features stated in paragraph b. above for the BMP-1, the MLI-84 has a 12.7-mm anti-aircraft machine gun mounted over the left side of the rear troop compartment.

(3) Vehicle Characteristics. The MLI-84 is fully amphibious being propelled through the water by its tracks. Specifications for the MLI-84 are provided in the lists and paragraphs that follow.

#### MLI-84 Measurements

Crew, 2.

Passengers, 9.

Combat weight, 16,600 kg.

Length, 7.32. meters.

Width, 3.15 meters.

Height, 1.97 meters.

Ground clearance, 0.4 meters.

(4) Armament Characteristics. The MLI-84 has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament for the MLI-84 is a 73-mm gun with a basic load of 40 rounds.

(b) Secondary Armament. Secondary armament consist of two weapons: a coaxially-mounted 7.62-mm machine gun with a basic ammunition load of 2,000 rounds and a 12.7-mm antiaircraft machine gun with a basic load of 500 rounds.

(c) Supplemental. Supplemental armament is an ATGW AT-3/SAGGER missile system with a basic load of 4 missiles.

(5) Countries Served. The MLI-84 is in service with the Romanian Army.

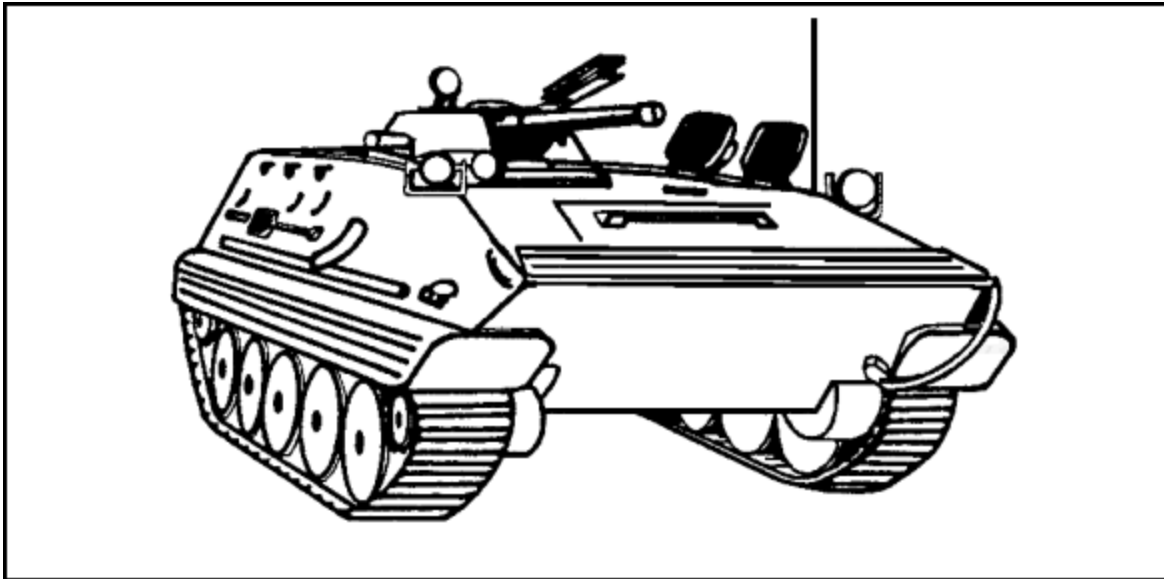


Figure 2-27. Type YW 309 Infantry Combat Vehicle (ICV) (China).

c. Type YW 309 ICV (Figure 2-27). The Type YW 309 ICV is essentially the Type 85 APC with some easily recognizable modifications that are presented in subparagraph (2) below. The Type YW 309 is also called the Infantry Fighting Vehicle Type 85. In this lesson it will be exclusively referred to as the YW 309.

(1) Variants. None.

(2) Recognition Features. The Type YW 309 shares basically the same recognition features previously stated for the Type 85 APC and will not be restated here. The Type YW 309, in addition to those basic features, has

- the same turret as the WZ 501 Infantry Fighting Vehicle (IFV) (discussed later in this lesson) which itself is a copy of the Soviet BMP-1.

- three firing ports and periscopes in the left side of the hull and four firing ports and periscopes in the right side of the hull (in addition to the single firing port in the rear hull door).
- a three-man crew and carries eight fully equipped infantrymen (as compared to the Type 85 APC which has a crew of two and can carry 13 infantrymen).

(3) Vehicle Characteristics. The Type YW 309 also shares basically the same vehicle characteristics as the Type 85 APC and only differs from the Type 85 APC in some areas. Those characteristics will not be restated here. Type YW 309 specifications are provided in the lists and paragraphs below.

#### Type YW 309 Measurements

<u>Crew</u> , 3.	<u>Track</u> , 2.526 meters.
<u>Passengers</u> , 8.	<u>Track width</u> , 360 mm.
<u>Combat weight</u> , 14,700 kg.	<u>Length of track on ground</u> , 3.275 meters.
<u>Length</u> , 6.27 meters.	<u>Maximum road speed</u> , 65 km/h.
<u>Width</u> , 3.06 meters.	<u>Maximum water speed</u> , 6 km/h.
<u>Height to top of hull</u> , 1.91 meters.	<u>Maximum range</u> , 500 km.
<u>Height including machine gun</u> , 2.475 meters.	
<u>Ground clearance</u> , 0.467 meters.	

(4) Vehicle Capabilities. The Type YW 309 can

- cross a 2.2-meter trench.
- mount a 0.6-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type YW 309 has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament is a 73-mm cannon with a basic load of 40 rounds.

(b) Secondary Armament. Secondary armament is a 7.62-mm machine gun coaxially mounted to the main armament.

(c) Supplemental Armament. Supplemental armament is a Red Arrow 73 missile launcher mounted over the main armament (as compared to the Type 85 APC which has only a 12.7-mm machine gun).

(6) Countries Served. The Type YW 309 ICV is in service with China and Thailand.



## 7. Infantry Fighting Vehicles (IFVs).

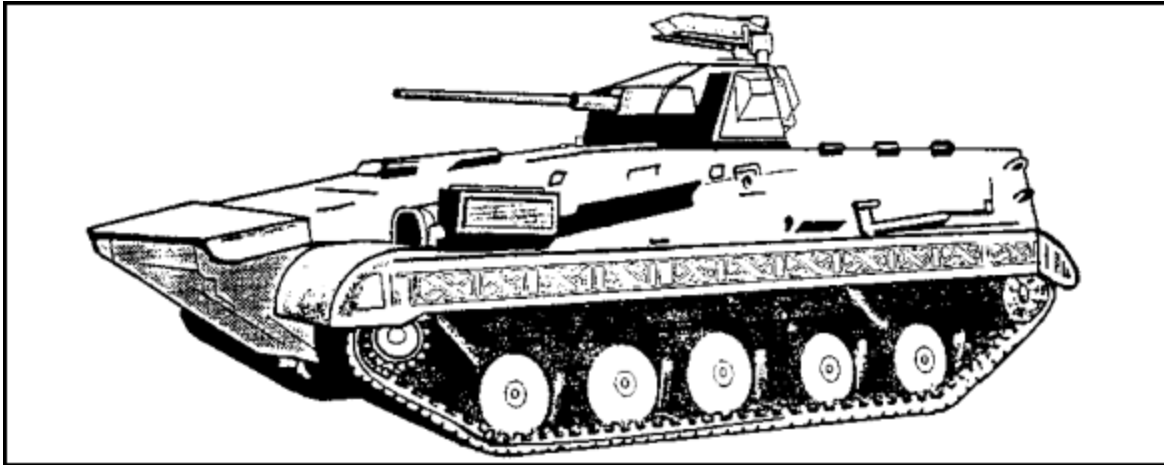


Figure 2-28. BVP M80AK IFV (Yugoslavia).

a. BVP M80AK Infantry Fighting Vehicle (IFV) (Figure 2-28). The BVP M80AK IFV is essentially the BVP M80A Mechanized Infantry Combat Vehicle (MICV), which is a further development of the M980 MICV with some easily recognizable modifications that are discussed in subparagraph (2) below. (The BVP M80A and M-980 MICVs are discussed in paragraph 10 subparagraphs a and b of this lesson.)

(1) Variants. None.

(2) Recognition Features. The BVP M80AK has a new oneman turret that supports a variety of armament unlike that used on the BVP M80A. Otherwise, the BVP M80AK shares the same basic recognition features as the BVP M80A.

(3) Vehicle Characteristics. The BVP M80AK also shares the same basic vehicle characteristics as the BVP M80A. Specifications for the BVP M80AK are provided in the lists and paragraphs that follow.

### BVP M80AK Measurements

Crew, 3.

Passengers, 8.

Combat weight, 14,400 kg.

Length, 6.27 meters.

Width, 3.06 meters.

Height to turret roof, 2.398 meters.

Height over anti-tank missiles, 2.87 meters.

Ground clearance, 0.467 meters.

Track, 2.526 meters.

Track width, 360 mm.

Length of track on ground, 3.30 meters.

Maximum road speed, 65 km/h.

Maximum water speed, 6.8 km/h.

Maximum range, 500 km.

(4) Vehicle Capabilities. The BVP M80AK can

- cross a 2.4-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The BVP M80AK has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament is a 30-mm M86 cannon.

(b) Secondary Armament. Secondary armament is a 7.62-mm machine gun mounted coaxially to the main armament.

(c) Supplemental Armament. Supplemental armament is a twin launcher for Yugoslavia built Sagger ATGWs and smoke dischargers that fire to the front of the vehicle. In addition, a variety of infantry weapons are carried onboard. These weapons include four 64-mm rocket launchers, two 7.62-mm machine guns, six 7.62-mm automatic rifles and a 26-mm signal pistol.

(6) Countries Served. The BVP M80AK IFV is in service with Yugoslavia.

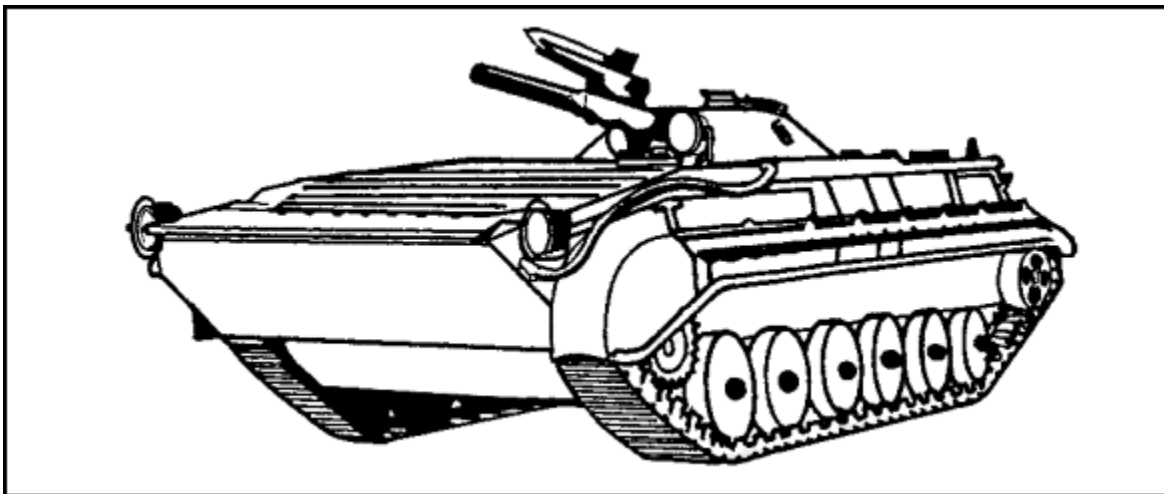


Figure 2-29. TYPE WZ 501 with Sagger ATGW over main armament.

b. TYPE WZ 501 Infantry Fighting Vehicle (IFV) ([Figure 2-29](#)). The TYPE WZ 501 IFV is almost a direct copy of the BMP-1 infantry combat vehicle (ICV) discussed in paragraph 6, subparagraph a of this lesson. The only major differences are a slight reduction in weight and maximum road speeds. The prototype of the WZ 501 IFV was copied from a single BMP-1 supplied by Egypt.

(1) Variants. Two variations of the Type WZ 501 are presented in the following two subparagraphs.

(a) Type 503 Infantry Fighting Vehicle. The Type 503 is essentially a WZ 501 IFV with its turret replaced by a simple mount, armed with a 12.7-mm machine gun with side and rear protection being provided for the machine gunner. The Type 503 has a combat weight of 12,800 kg, a two-man crew and can carry 13 infantrymen.

(b) Type 504 Missile Launcher Vehicle. The Type 504 is essentially a WZ 501 IFV with a new turret that is armed with two Red Arrow 73B ATGWs, which is the Chinese produced version of the Soviet Sagger AT-3. In addition to the two missiles in the ready to launch position, a further 14 missiles are carried in reserve. When travelling, the launcher, complete with overhead protection, is retracted into the turret. The Type 504 has a combat weight of 13,500 kg and in addition to its fourman crew, can carry two passengers.

(2) Recognition Features. The TYPE WZ 501 shares the same basic recognition features as the BMP-1, discussed in paragraph 6 subparagraph a of this lesson.

(3) Vehicle Characteristics. The TYPE WZ 501 is fully amphibious and shares the same basic vehicle characteristics as the BMP-1. Specifications for the TYPE WZ 501 are provided in the lists and paragraphs that follow.

#### TYPE WZ 501 Measurements

Crew, 3.

Passengers, 8.

Combat weight, 13,300 kg.

Length, 6.74 meters.

Width overall, 2.97 meters.

Height overall, 2.14 meters.

Maximum road speed, 65 km/h.

Maximum water speed, 7-8 km/h.

Maximum road range, 460-510 km.

Maximum water range, 100 km.

(4) Vehicle Capabilities. The TYPE WZ 501 can

- cross a 2-meter trench.
- mount a 0.6- to 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The TYPE WZ 501 has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament is the same as that for the BMP-1: a 73-mm smoothbore gun with a basic load of 40 rounds.

(b) Secondary Armament. Secondary armament is the same as that for the BMP-1: a 7.62-mm machine gun, coaxially mounted to the main armament, with a basic load of 2,000 rounds.

(c) Supplemental Armament. Supplemental armament is four Red Arrow ATGWs which are copies of the Sagger. (The original Soviet vehicle has a Sagger wire-guided ATGW mounted above the 73-mm gun). In addition, a variety of infantry weapons are carried onboard the Type WZ 501. These weapons include seven 7.62-mm Submachine guns (SMGs), two 7.62-mm Light machine guns (LMGs), a new 40-mm man-portable rocket launcher and a manportable surface-to-air missile called Red Tassel, which is a copy of the Soviet SA-7 Grail.

(6) Countries Served. The TYPE WZ 501 IFV is in service with the Chinese Army.

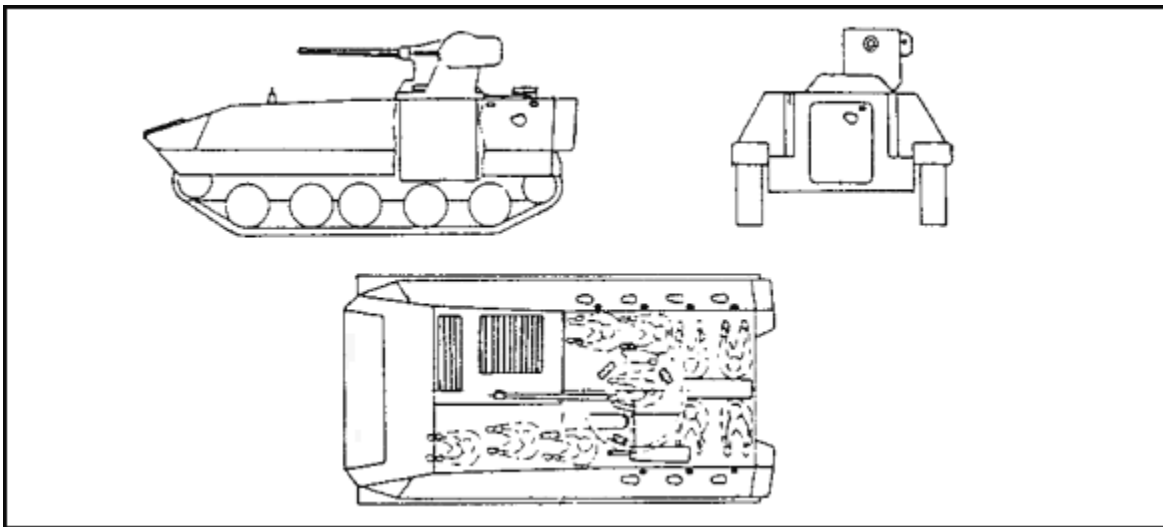


Figure 2-30. TYPE TW 307 IFV (China)

c. TYPE YW 307 Infantry Fighting Vehicle (IFV) ([Figure 2-30](#)). The Type YW 307 IFV is essentially a Type YW 534 APC with a one-man power-operated turret and two layers of armament compared to the Type YW 534s one layer. Armament characteristics are discussed in subparagraph (5) below. Other major differences are weight and maximum road speeds, given in subparagraph (3) below.

(1) Variants. None.

(2) Recognition Features. The Type YW 307 shares the same basic recognition features as the Type YW 534, discussed in paragraph 3 subparagraph (2) of this lesson and will not be discussed in detail here.

(3) Vehicle Characteristics. The Type YW 307 is fully amphibious and shares the same basic vehicle characteristics as the Type YW 534. Specifications for the Type YW 307 are provided in the lists and paragraphs that follow.

## Type YW 307 Measurements

<u>Crew</u> , 3.	<u>Ground clearance</u> , 0.48 meters.
<u>Passengers</u> , 7.	<u>Track width</u> , 360 meters.
<u>Combat weight</u> , 14,300 kg.	<u>Track</u> , 2.626 meters.
<u>Length</u> , 6.15 meters.	<u>Length of track on ground</u> , 3.425 meters.
<u>Width overall</u> , 3.134 meters.	<u>Maximum road speed</u> , 65 km/h.
<u>Height to hull top</u> , 1.88 meters.	<u>Maximum water speed</u> , 6 km/h.
<u>Height over turret</u> , 2.556 meters.	<u>Maximum road range</u> , 500 km.

(4) Vehicle Capabilities. The Type YW 307 can

- cross a 2.5-meter trench.
- mount a 0.7-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The Type YW 307 has two layers of armament: main and secondary.

(a) Main Armament. Main armament is a externally mounted 25-mm cannon with a basic load of 400 rounds.

(b) Secondary Armament. Secondary armament is an external 7.62-mm machine gun, mounted coaxially to the main armament, with a basic load of 1,100 rounds and two banks of four smoke dischargers.

(6) Countries Served. The Type YW 307 IFV is in service with the Chinese Army.

## 8. Light Amphibious Tank (LAT).

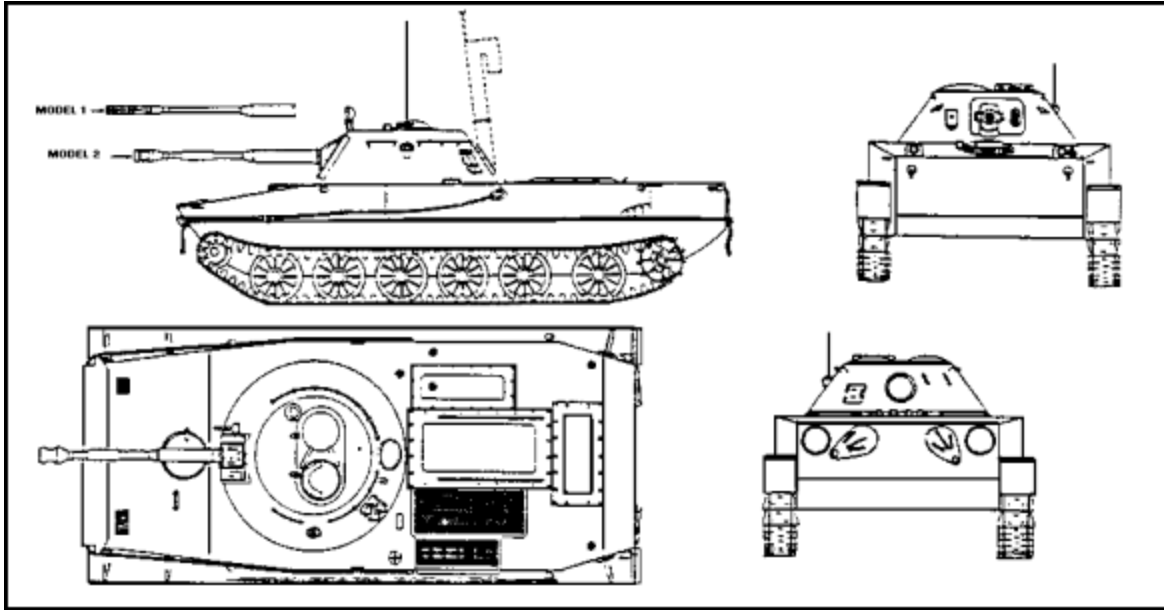


Figure 2-31. PT-76 LAT with D-56T gun (Soviet).

PT-76 Light Amphibious Tank (LAT) ([Figure 2-31](#)). The Soviets have replaced their PT-76 LATs with T-54, T-55, T-62 or T-72 heavy armored main battle tanks (MBTs) or even light armored BMP infantry combat vehicles (ICVs). Many automotive and subcomponents of the PT-76 LAT are also used in the BTR-50 armored personnel carrier (APC) and other vehicles. The PT-76s excellent amphibious capability is attained at the cost of its armor, which is very thin and can be penetrated by heavy machine gun fire.

a. Variants. The first production version of the Pt-76 light tank (Model 1) was armed with the D-56T gun and fitted with a multi-slotted muzzle brake. This version is rarely seen today. The most common version of the PT-76 (Model 2) is fitted with the D-56T gun with double-baffle muzzle brake and a bore evacuator towards the muzzle as shown in [Figure 2-31](#). For training the muzzle brake is sometimes removed. Another model (Model 3) is similar to the Model 2 but has no bore evacuator. A fully stabilized gun model (Model 4), designated the D-56TM, is also known as the PT-76B. Two other variants are discussed below.

(1) Chinese Type 63. This version has a hull similar to that on the PT-76 but has a different turret.

(2) NIMBA Upgrade Package for PT-76. The Israeli company NIMBA offers a complete retrofit package for the PT-76 LAT. The package includes a new powerpack, replacement of the 76-mm gun and the installation of advanced fire control and turret systems.

b. Recognition Features. The PT-76 has

- six road wheels with the drive sprocket at the rear, idler at the front and no track return rollers. The first and sixth road wheel stations have hydraulic shock absorbers.

- a single-piece driver's hatch cover that swings to the right and three periscopes mounted forward of the hatch.
- a turret, with a circular shaped bulge on the back, placed forward on the hull.
- an oval-shaped hatch cover on top of the turret that hinges forward and can be locked vertical. Mounted in the left side of the hatch cover is a circular cupola for the commander which houses three integral periscopes.
- a loaders's periscope is mounted in the turret roof, forward of the hatch cover.
- a optical sight mounted to the left of the main armament.
- a ventilator is mounted in the turret rear. A snorkel extension piece can be fitted to the ventilator.
- optional drum- or flat-type fuel tanks that are similar to those used on one side of the T-54/T-55 MBTs for an increase operational range.
- a searchlight mounted on the right side of the turret and one of the driving lights may be infrared. (Some models may be fitted with a infrared searchlight on the turret.) The Soviet Naval Infantry often installs a complete set of navigation lights to the PT-76.
- a fully amphibious capability.
- a rectangular shaped hull with boat like front.
- two waterjets and covers on the rear of the hull.
- a trim vane that is erected at the front of the hull before entering the water.

c. Vehicle Characteristics. The PT-76 LAT has an all-welded steel hull divided into three main compartments with the driver at the front, fighting compartment in the center, and the engine and transmission at the rear. The PT-76 is fully amphibious, being propelled through the water by two water jets mounted at the rear. The PT-76 has a three-man crew: the tank commander (gunner), driver and loader. The turret is all-welded steel, with the commander, who also acts as the gunner, seated on the left and the loader on the right. Specifications that apply to the PT-76 are provided in the lists and paragraphs that follow.

## PT-76 Measurements

<u>Crew</u> , 3.	<u>Track</u> , 2.74 meters
<u>Combat weight</u> , 14,000 kg.	<u>Track width</u> , 360 mm.
<u>Length overall</u> , 7.625 meters.	<u>Track length on ground</u> , 4.08 meters.
<u>Hull length</u> , 6.91 meters.	<u>Fuel capacity main</u> , 250 liters.
<u>Hull width</u> , 3.14 meters.	<u>Fuel capacity auxiliary</u> , 180 liters.
<u>Height overall early model</u> , 2.195 meters.	<u>Maximum road range</u> , 260 km.
<u>Height overall late model</u> , 2.255 meters.	<u>Maximum road range with tanks</u> , 450 km.
<u>Ground clearance</u> , 0.37 meters.	<u>Maximum water range</u> , 65 km.
	<u>Maximum road speed</u> , 44 km/h.
	<u>Maximum water speed</u> , 10 km/h.

## PT-76 Armor

<u>Hull Armor Thickness</u>	<u>Turret Armor Thickness</u>
<u>Front upper</u> , 11 mm.	<u>Front</u> , 17 mm.
<u>Front lower</u> , 14 mm.	<u>Sides</u> , 16 mm.
<u>Side upper and lower</u> , 14 mm.	<u>Rear</u> , 11 mm.
<u>Rear upper and lower</u> , 7 mm.	<u>Top</u> , 8 mm.
<u>Top</u> , 10 mm.	<u>Mantlet</u> , 11 mm.
<u>Belly front and rear</u> , 5 mm.	

d. Vehicle Capabilities. The PT-76 can

- cross a 2.8-meter trench.
- mount a 1.1-meter vertical step.
- climb a 70-percent grade.
- ford amphibiously.

e. Armament Characteristics. The PT-76 has two layers of armament: main and secondary.

(1) Main Armament. PT-76 main armament is a 76-mm gun with a rate of fire up to eight rds/min and a load of 40 rounds.

(2) Secondary Armament. Secondary armament is a 7.62-mm machine gun mounted coaxially to the main armament. Many PT-76s are fitted with the 12.7-mm DShKM anti-aircraft machine gun.

f. Countries Served. The PT-76 LAT is in service with the following countries:

Afghanistan	Egypt	Iraq	Poland
Algeria	Finland	Kampuchea	Soviet Union
Angola	Germany, (East)	Korea, North	Vietnam
Benin	Guinea	Laos	Yugoslavia
China	Guinea-Bissau	Madagascar	Zambia
Congo	Hungary	Mozambique	
Cuba	Indonesia	Nicaragua	



## 9. Mountaineers Combat Vehicle (MCV).

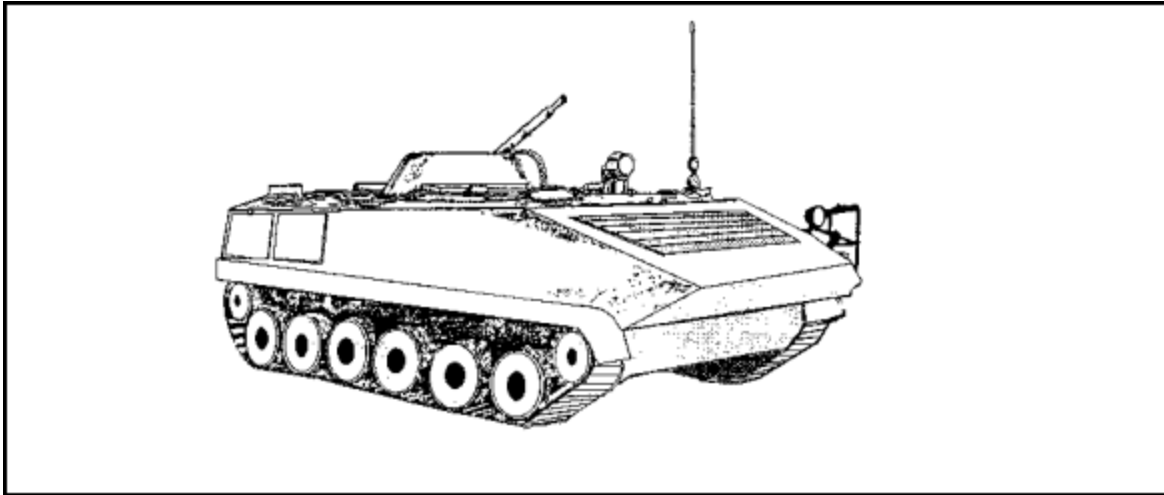


Figure 2-32. MLVN Mountaineers Combat Vehicle (MCV) (Romania).

MLVN Mountaineers Combat Vehicle (MCV) (Figure 2-32). The MLVN has been designed specifically for mountain terrain. It can carry an assault group of seven men in addition to a two-man crew consisting of the commander and driver. It can also be used to carry stores and ammunition in the forward battlefield area.

### a. Variants. Two MLVN variants are discussed below.

(1) 120-mm Mortar Carrier. This version has a higher superstructure than the MLVN and is fitted with a 120-mm mortar that fires to the rear. A baseplate is carried on the rear of the hull for dismounted use.

(2) Abal Armored Vehicle for Combat Supply. This version is very similar to the MLI-84 but has been designed to carry ammunition in the forward area. For example: 64 rounds of 100 or 104 rounds of 76-mm ammunition with total payload of 2,100 kg. Some of the ammunition is stowed in ready use lockers in each side of the hull with external access doors. Other ammunition is stowed inside. This version does not have turret-mounted machine guns; although a 7.62-mm machine gun is mounted to the rear of the driver's position. Specifications for the Abal are similar to the MLI-84, discussed previously, except for the following: a combat weight of 10,500 kg, a width of 2.714 meters, a height of 1.90 meters, a maximum road speed of 32 km/h, a road range of 666 km, a cross-country range of 383 km and a fuel capacity of 450 liters.

### b. Recognition Features. The MLVN has

- six rubber-tired road wheels with the drive sprocket at the front, idler at the rear and track return rollers.
- a drivers single-piece hatch cover.
- three periscopes, mounted in front of the driver for forward observation, one of which can be replaced with a night vision device.

- a commander's single-piece hatch cover and three periscopes, one of which can be raised for forward observation. o a commander's external infrared searchlight.
- a turret located in the center of the hull. o a troop compartment with rear roof hatches.
- six firing ports (three in each side of the hull) each with an associated periscopes.
- a door in the hull rear which has two firing ports and two periscopes as well as containing some diesel fuel.

c. Vehicle Characteristics. The MLVN has an all-welded steel hull and turret. The driver is seated at the front of the vehicle on the left side with the commander seated to the driver's rear. Specifications for the MLVN are provided in the lists and paragraphs that follow.

#### MLVN Measurements

Crew, 2.

Passengers, 7.

Combat weight, 9,800 kg.

Length, 5.85 meters.

Width, 2.87 meters.

Height to turret roof, 1.95 meters.

Height to top of hull, 1.55 meters.

Ground clearance. 0.38 meters.

Maximum road speed, 48 km/h.

Maximum road range, 680 to 740 km.

Maximum off-road range, 370 to 400 km.

Fuel capacity (liters), 360 main tank-120 door tank.

d. Vehicle Capabilities. The MLVN can

- cross a 1.5-meter trench.
- mount a 0.6-meter vertical step.
- climb a 60-percent grade.
- climb a 30-percent side slope.
- ford 0.6 meters.

e. Armament Characteristics. The MLVN has two layers of armament: main and secondary.

(1) Main Armament. Main armament is a 14.5-mm machine gun.

(2) Secondary Armament. Secondary armament is a 7.62-mm machine gun, mounted coaxially to the main armament.

f. Countries Served. The MLVN is in service with the Romanian Army.

10. Mechanized Infantry Combat Vehicle (MICV).

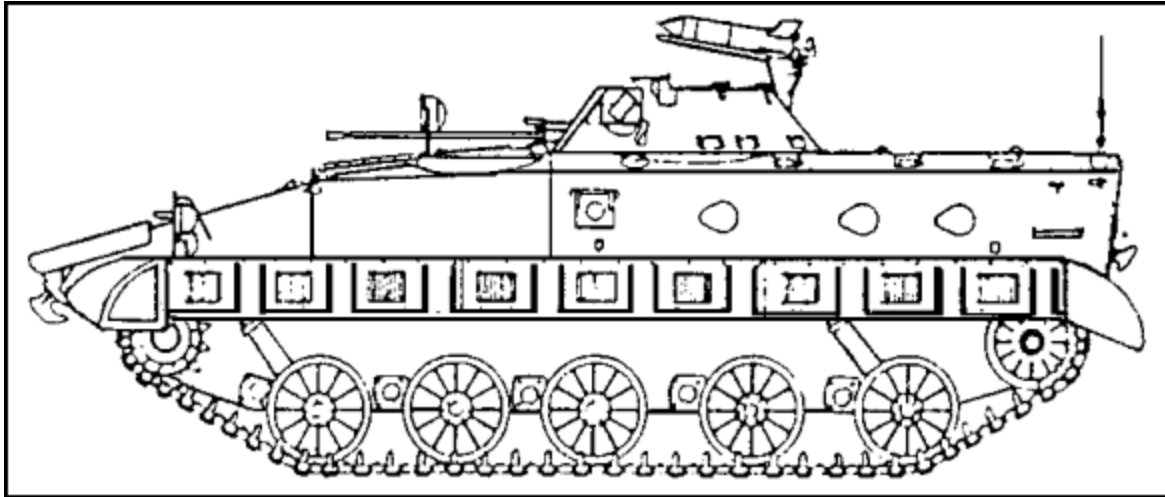


Figure 2-33. M-980 MICV (Yugoslavia).

a. M-980 Mechanized Infantry Combat Vehicle (Figure 2-33). The M-980 MICV was designed in Yugoslavia but uses a number of foreign components; for example: the ATGW Soviet Sagger and the 20-mm cannon is manufactured in Switzerland.

(1) Variants. None.

(2) Recognition Features. The M-980 MICV has

- five single rubber-tired road wheels with the drive sprocket at the front, idler at the rear and track return rollers. Hydraulic shock absorbers are fitted at the first and last road wheel stations.
- a skirt that covers the top of the track.
- a driver's single-piece hatch cover that lifts and swings to the right to open.
- three periscopes in front of the driver's hatch; the center one of which can be replaced by an infrared or image intensification periscope for night driving.
- a commander's cupola with a single-piece hatch cover that open forwards and can be locked vertical.
- an infrared searchlight mounted on the forward part of the commander's cupola.
- a one-man turret to the rear of the engine compartment and offset to the right of the vehicle's centerline.
- three vision blocks in the left side and rear of the turret.
- two forward-facing periscopes and a single-piece hatch cover that opens to the rear on the left side of the turret roof.
- a troop compartment at the rear of the vehicle.

- two troop entry/exit doors in the rear of the hull, each of which has a firing port and a vision block.
- three firing ports on each side of the hull, each with a periscope in the roof.
- two oval roof hatches over the top of the troop compartment that are hinged in the center and can be locked vertically.
- an engine that is mounted to the right of the driver with the air-inlet and air-outlet louvers in the roof.
- an exhaust outlet in the right side of the hull.
- a trim vane that is erected at the front of the hull before entering the water and stowed on the glacis plate when not in use.
- smoke laying capability.

(3) Vehicle Characteristics. The hull of the M-980 is made of all-welded steel; although aluminum may be used in some non-critical areas. Fully amphibious, the M-980 is propelled through the water by its tracks. The M-980 has a three-man crew with the driver sitting at the front of the hull on the left in front of the commander and the gunner at the turret. Specifications that apply to the M-980 are provided in the lists and paragraphs that follow.

#### M-980 Measurements

<u>Crew</u> , 3.	<u>Ground clearance</u> , 0.4 meters.
<u>Passengers</u> , 8.	<u>Track</u> , 2.47 meters.
<u>Combat weight</u> , 13,700 kg.	<u>Track width</u> , 300 mm.
<u>Length</u> , 6.4 meters.	<u>Length of track on ground</u> , 3.484 meters.
<u>Width</u> , 2.59 meters.	<u>Maximum road speed</u> , 60 km/h.
<u>Height to turret roof</u> , 2.3 meters.	<u>Maximum water speed</u> , 7.5 km/h.
<u>Height over anti-tank missiles</u> , 2.5 meters.	<u>Maximum road range</u> , 500 km.
<u>Height to hull roof</u> , 1.8 meters.	<u>Maximum cross-country range</u> , 300-350 km.

#### M-980 Armor

<u>Front</u> , 25-30 mm.	<u>Floor and rear</u> , 12 mm.
<u>Sides</u> , 15 mm.	<u>Turret front</u> , 20 mm.
<u>Top</u> , 8 mm.	

(4) Vehicle Capabilities. The M-980 can

- cross a 2.2-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The M-980 has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament is a 20-mm cannon with a basic ammunition load of 400 rounds.

(b) Secondary Armament. Secondary armament is a 7.62-mm machine gun mounted coaxially to the main armament with a basic ammunition load of 2,250 rounds.

(c) Supplemental Armament. Supplemental armament is a twin launcher for the Soviet Sagger ATGWs with a load of four missiles.

(6) Countries Served. The M-980 MICV is in service with Yugoslavia.

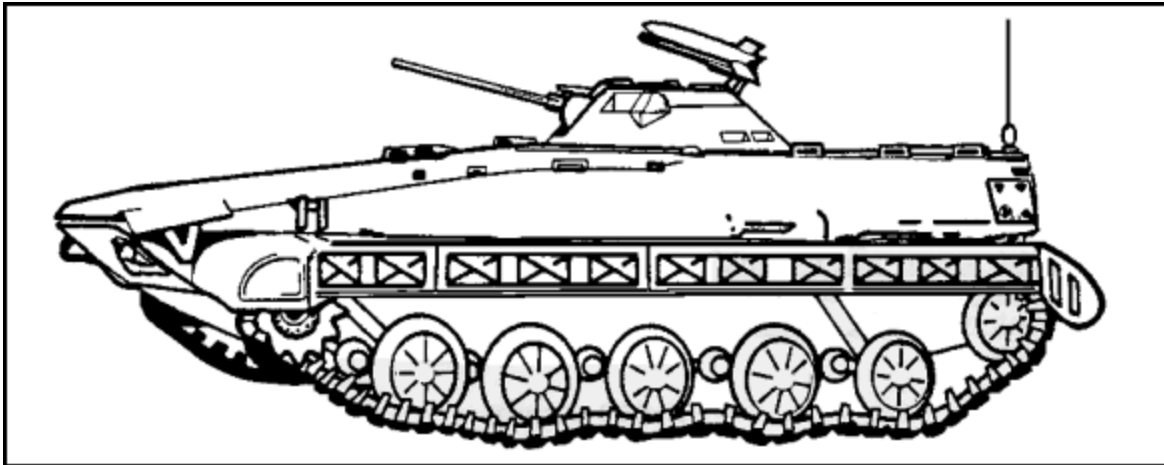


Figure 2-34. BVP M80A MICV with Sagger ATGWs (Yugoslavia).

b. BVP M80A Mechanized Infantry Combat Vehicle (Figure 2-34). The BVP M80A mechanized infantry combat vehicle (MICV) is a further development of the M-980 and is believed to be the replacement for the M-980 vehicle discussed previously.

(1) Variants. There are no known variants of the BVP M80A; although battalion and company command versions are already in service with the Yugoslavian Army.

(2) Recognition Features. The overall layout of the BVP M80A is identical to that of the M-980, but with a few exceptions that are covered in the following paragraphs.

(3) Vehicle Characteristics. The BVP M80A is slightly heavier, slightly wider and higher, has a greater ground clearance and a slightly higher road speed than the M-980 MICV. Specifications that apply to the BVP M80A are provided in the lists and paragraphs that follow.

## BVP M80A Measurements

<u>Crew</u> , 2.	<u>Ground clearance</u> , 0.4 meters.
<u>Passengers</u> , 8.	<u>Maximum road speed</u> , 64 km/h.
<u>Combat weight</u> , 14, 000 kg.	<u>Maximum water speed</u> , 7.8 km/h.
<u>Length</u> , 6.42 meters.	<u>Fuel capacity</u> , 510 liters.
<u>Width</u> , 2.995 meters.	<u>Maximum road range</u> , 500 km.
<u>Height to top of ATGW</u> , 2.67 meters.	<u>Maximum cross-country range</u> , 300-350 km.

### (4) Vehicle Capabilities. The BVP M80A can

- cross a 2.4-meter trench.
- mount a 0.8-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

### (5) Armament Characteristics. The BVP M80A has three layers of armament: main, secondary and supplemental.

(a) Main Armament. Main armament is a 20-mm cannon with a basic ammunition load of 1,400 rounds.

(b) Secondary Armament. Secondary armament is a 7.62-mm machine gun mounted coaxially to the main armament with a basic ammunition load of 2,000 rounds.

(c) Supplemental Armament. Supplemental armament is a twin launcher for the Soviet Sagger ATGWs with a load of four missiles.

### (6) Countries Served. The BVP M80A MICV is in service with the Yugoslavian Army.

11. Multipurpose Tracked Vehicle (MT-LB).

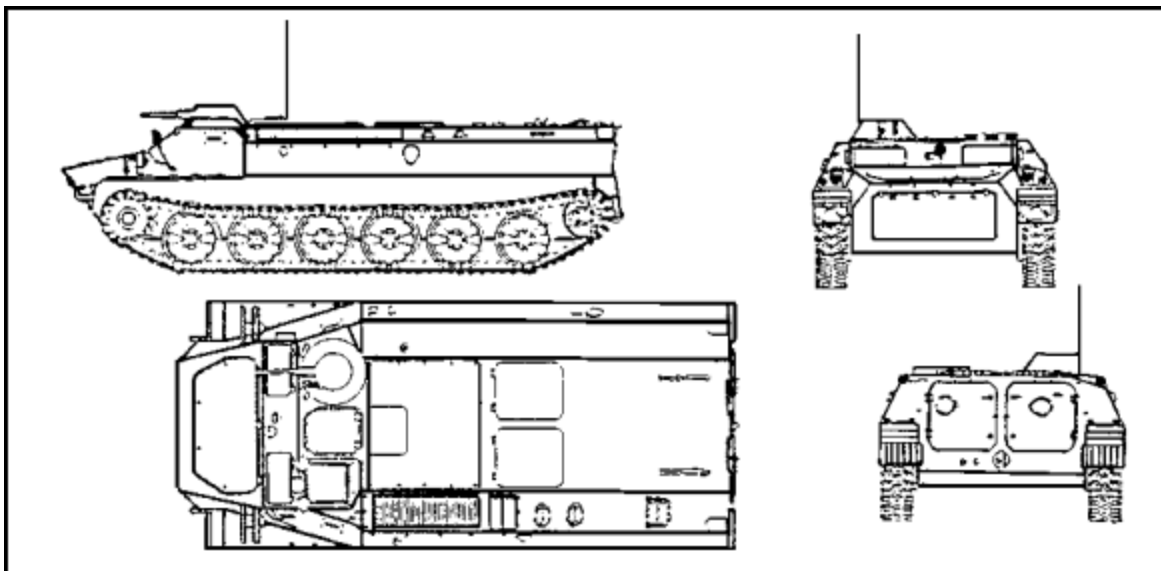


Figure 2-35. MTLB (MTV) (Soviet).

Multipurpose Tracked Vehicle (MT-LB) (Figure 2-35). The MT-LB is a multipurpose soft-terrain vehicle that can be used as an APC or command vehicle, a prime mover for various types of artillery and a cargo and general transport vehicle.

(1) Variants. The MT-LB chassis has become the basis for a variety of other vehicles such as the 122-mm self-propelled howitzer 2S1, 120-mm self-propelled howitzer 2S12 and the SA13/GOPHER surface-to-air missile system. A number of other MT-LB variants are presented in the following subparagraphs.

(a) MT-LBV. This is the basic version fitted with wider (565-mm) tracks for operations in snow or swampy areas.

(b) MT-LBU. This is the command control and commander's version.

(c) MT-SON (MT-LB with BIG FRED Radar). Possibly the MT-SON and MT-LB with BIG FRED radar are the same version, mounting PORK TROUGH radar.

(d) MTP-LB. This is the field maintenance version for repair and recovery.

(e) MT-LB Armored Ambulance.

(f) MT-LBRKhM. This is a radiological-chemical reconnaissance version.

(2) Recognition Features. The MT-LB has

- six road wheels with a large drive sprocket at the front and no return rollers.
- a low-silhouette, box-like symmetrical shape.
- sharp bow with a large plate bolted on top.

- a square-shaped rear with two flat entry/exit doors that have one firing port each.
- four firing ports on each side of the vehicle.
- two additional, forward-opening, troop exit hatches located on the flat hull roof.
- engine louvers behind the driver on the left side that require a metal cover during fording operations.
- small flat topped turret on the right front that mounts a 7.62-mm machine gun.
- one handle over each rear door.

(3) Vehicle Characteristics. The MT-LB is an amphibious armored tracked vehicle with a hull made of welded steel plates. The vehicle has a two-man crew consisting of the driver and commander-gunner and is lightly armed and lightly armored. Specifications that apply to the MT-LB are provided in the lists and paragraphs that follow.

#### MT-LB Measurements

<u>Crew</u> , 2.	<u>Ground clearance</u> , 0.4 meters.
<u>Passengers</u> , 11.	<u>Maximum road speed</u> , 60 km/h.
<u>Combat weight</u> , 11,900 kg.	<u>Maximum water speed</u> , 6 km/h.
<u>Length</u> , 6.45 meters.	<u>Fuel capacity</u> , 450 liters.
<u>Width</u> , 2.85 meters.	<u>Maximum road range</u> , 500 km.
<u>Height</u> , 1.87 meters.	

#### MT-LB Armor

<u>Hull</u>	<u>Turret</u>
7 mm.	7 mm.

(4) Vehicle Capabilities. The MT-LB can

- cross a 2.70-meter trench.
- mount a 0.70-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. The MT-LB has one layer of armament: a 7.62-mm PKT machine gun with a practical rate of fire of 250 rds/min and a basic ammunition load of 2,000 rounds.

(6) Countries Served. The BVP M80A MICV is in service with Bulgaria, (East) Germany, Hungary, Poland, Soviet Union, and Yugoslavia.



12. Tank Destroyer (TD).

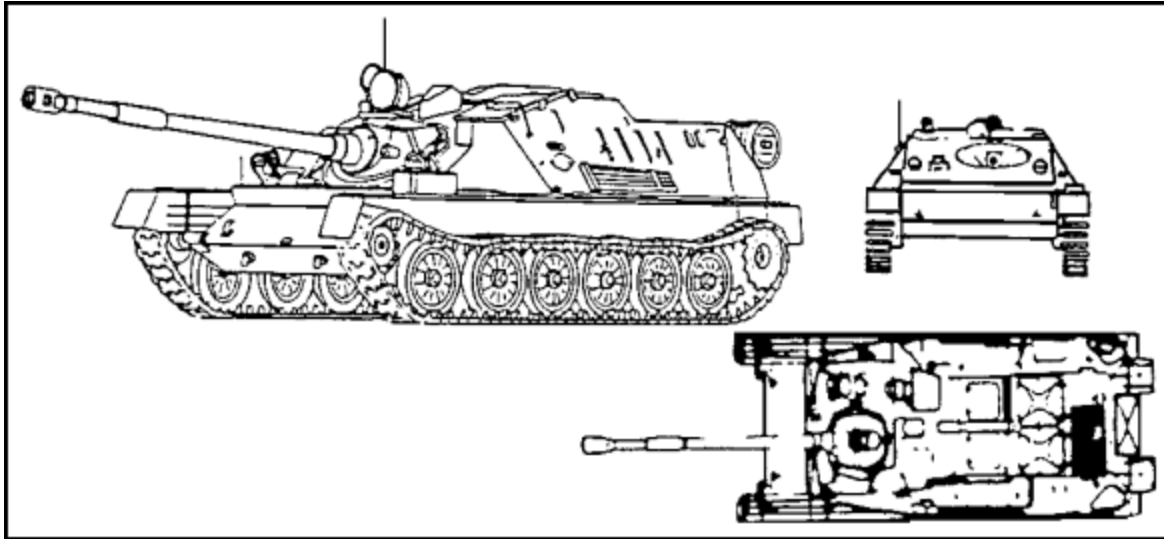


Figure 2-36. ASU-85 Airportable Self-propelled Anti-tank Gun.

Airportable Self-propelled Anti-tank Gun (ASU-85) ([Figure 2-36](#)). ASU is the Soviet designation for the airborne assault gun and 85 is for the caliber of the gun. The ASU-85 is the replacement for the ASU-57 57 mm, which is no longer in service with the Soviet Army. The ASU-85 is used primarily in an anti-tank role.

- a. Variants. There are no known variants of the ASU-85.
- b. Recognition Features. The ASU-85 has
  - six rubber-tired road wheels with a distinct gap between the first and second road wheels. The drive sprocket is at the rear, the idler at the front and no track return rollers.
  - an engine and transmission at the rear of the hull with two large square hatches in the roof for access to the engine for maintenance.
  - air inlet and outlet louvers on the top of the roof at the left rear with the exhaust outlet in the rear of the hull on the left side below the external stowage box.
  - a large metal stowage box at the rear of the hull, each side of which is a long-range fuel drum.
  - a vision block to the front of the driver with a periscope above it and another vision block in the right side of the hull.
  - a commander's single-piece hatch cover in the roof that opens forwards and can be locked vertically.
  - a periscope in front of the commander's hatch above which is an infrared searchlight.
  - a single-piece hatch cover in the roof that opens to left and has a periscope. The gunner and loader enter and leave through this hatch cover.

- a single vision block and firing port in the left side of the hull.
- another two hatches in the roof of the vehicle behind the forward hatches, both open forwards.
- a single vision block is fitted in the rear of the fighting compartment on the right side.
- a well-sloped glacis plate and splash board that prevents water rushing up the glacis when the vehicle is fording.

c. Vehicle Characteristics. The ASU-85 has no amphibious capability. It has an all-welded steel hull with the fighting compartment at the front and the engine and transmission at the rear. The driver is seated at the front of the vehicle on the right with the commander seated behind the driver. The gunner and loader are seated on the left of the main armament. Specifications that apply to the ASU-85 are provided in the lists and paragraphs that follow.

#### ASU-85 Measurements

<u>Crew</u> , 4.	<u>Ground clearance</u> , 0.4 meters.
<u>Combat weight</u> , 15,500 kg.	<u>Track</u> , 2.66 meters.
<u>Length</u> , 6 meters.	<u>Track width</u> , 360 mm.
<u>Width</u> , 2.8 meters.	<u>Length of track on ground</u> , 4.195 meters.
<u>Height without anti-aircraft machine gun</u> , 2.1 meters.	<u>Maximum road speed</u> , 45 km/h.
	<u>Fuel capacity</u> , 250 liters.
	<u>Maximum road range</u> , 260 km.

#### ASU-85 Armor

<u>Glacis</u> , 40 mm.	<u>Hull top</u> , 8 mm.
<u>Sides upper</u> , 15 mm.	<u>Hull floor</u> , 10 mm.
<u>Mantlet</u> , 40 mm.	<u>Hull rear</u> , 10 mm.

d. Vehicle Capabilities. The ASU-85 can

- cross a 2.8-meter trench.
- mount a 1.1-meter vertical step.
- climb a 70-percent grade.
- ford 1.1 meters.

e. Armament Characteristics. The ASU-85 has three layers of armament: main, secondary and supplemental.

(1) Main Armament. Main armament is a 85-mm D-70 gun that is mounted in the glacis plate slightly offset to the left of the vehicle's centerline. The weapon has a double-baffle muzzle brake and a fume extractor. The main armament has a basic ammunition load of 40 rounds.

(2) Secondary Armament. Secondary armament is a 7.62-mm SGMT machine gun, mounted coaxially to the right of the main armament with a basic ammunition load of 2,000 rounds.

(3) Supplemental Armament. Recently, some vehicles have been observed with a 12.7-mm DShKM machine gun mounted on the roof for anti-aircraft defense.

f. Countries Served. The BVP M80A MICV is in service with the Soviet Union.

### 13. Tracked Artillery Radar and Reconnaissance Vehicles.

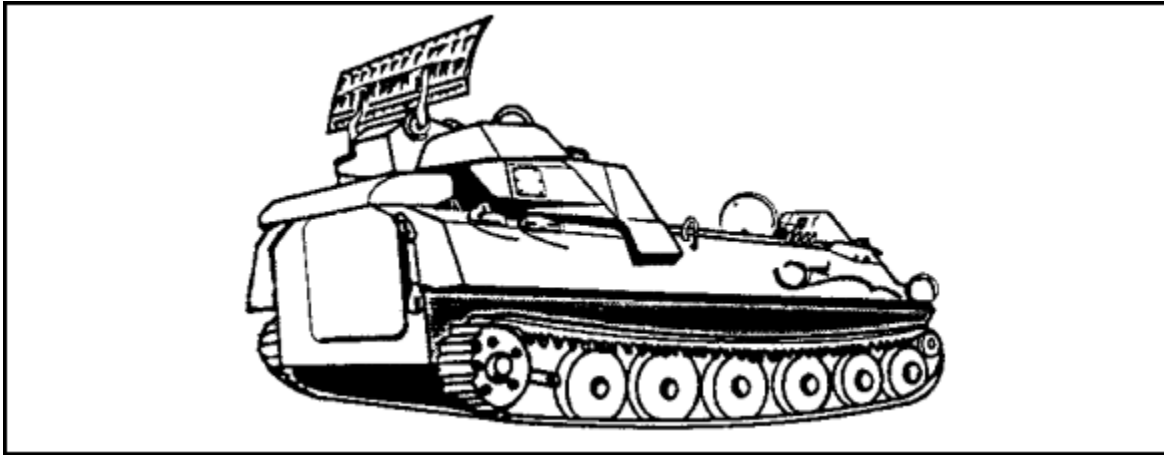


Figure 2-37. BIG FRED Battlefield Surveillance Radar (Soviet).

a. BIG FRED (MT-LB M1975 Variant) ([Figure 2-37](#)). The Big Fred battlefield surveillance radar is one of many varieties of Threat vehicles based on the successful MT-LB chassis.

(1) Variants. None.

(2) Recognition Features. Big Fred has

- six road wheels with a large drive sprocket at the front and no return rollers.
- a sharp bow with a large plate bolted on top.
- a square-shaped rear with two flat doors.
- a small flat-topped turret located well forward and mounting a 7.62-mm machine gun.
- a box-like symmetrical shape.
- a prominent rear-mounted turret with a top hatch and blade-like rectangular antenna folded down when not in use.

(3) Vehicle Characteristics. Big Fred is fully amphibious. The hull is of all-welded steel construction and in contrast to other MT-LB variants, does not utilize a modified or lengthened chassis. The Big Fred radar is mounted on the rear half of the MT-LB chassis. The driver is seated at the front of the vehicle on the left with the commander seated to his right. Specifications that apply to the Big Fred are provided in the lists and paragraphs that follow.

## Big Fred Measurements

Crew, 4.

Length, 6.45 meters.

Height with radar, 2.85 meters.

Height to top of hull, 1.83 meters.

Ground clearance, 0.40 meters.

Maximum road speed, 60 km/h.

Maximum water speed, 6 km/h.

Fuel Capacity, 450 liters.

Range, 500 km.

Hull/turret armor, 7 mm.

Information regarding radar housing armor, is not available.

### (4) Vehicle Capabilities. Big Fred can

- cross a 2.70-meter trench.
- mount a 0.70-meter vertical step.
- climb a 60-percent grade.
- climb a 40-percent side slope.
- ford amphibiously.

(5) Armament Characteristics. Big Fred has one layer of armament: a 7.62-mm PKT machine gun that has a practical rate of fire of 250 round per minute with a basic load of 2,000 rounds.

(6) Countries Served. The Big Fred battlefield surveillance radar is in service with the following countries:

Bulgaria  
Germany, (East)

Hungary  
Poland

Soviet Union

Yugoslavia.

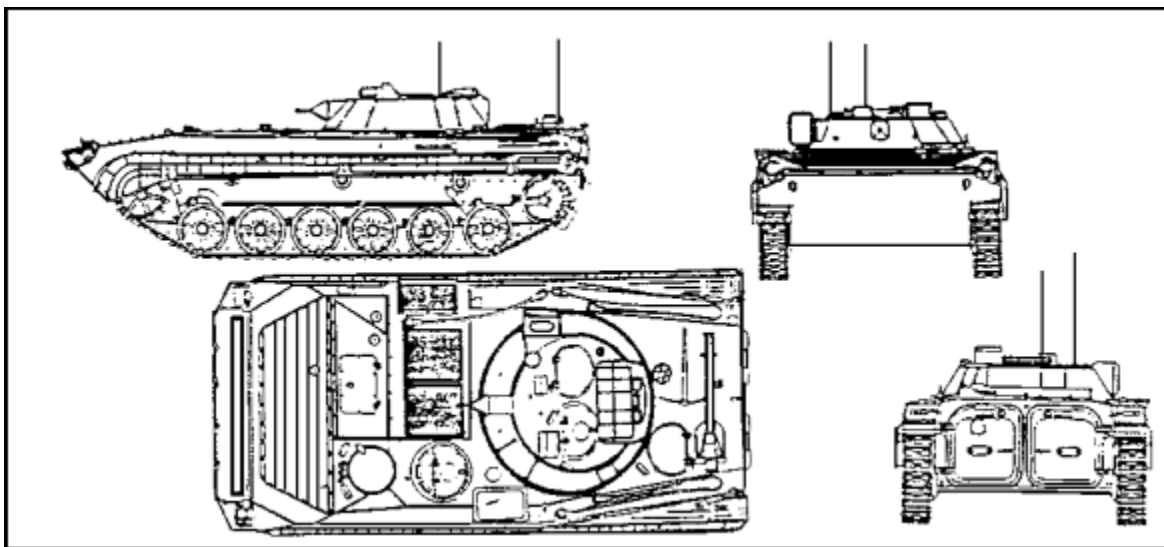


Figure 2-38. SMALL FRED Battlefield Surveillance Radar (PRP-3).

b. Small Fred (PRP-3) (BMP M-1975 Variant) (Figure 2-38). Small Fred (PRP-3) is a highly mobile artillery reconnaissance vehicle. The PRP-3 is basically a BMP amphibious infantry

combat vehicle with an enlarged two-man turret that has been moved aft a few inches, a single 7.62-mm machine gun, no cannon, no ATGMs and no firing ports.

(1) Variants. None.

(2) Recognition Features. The PRP-3 has

- six road wheels with three return rollers.
- a sloping front glacis with laterally placed strips of raised "ribbing."
- two bulging, fuel containing, entry/exit doors in the rear.
- a large two-man turret located toward the rear with a coaxially-mounted 7.62-mm machine gun.
- a prominent rectangular-shaped folding radar antenna mounted on the rear of the turret. When folded and viewed from the side, the radar is a barely discernable bulge.

(3) Vehicle Characteristics. The PRP-3 is fully amphibious, being propelled through the water by its tracks. The hull is of all-welded steel construction with the driver seated at the front of the vehicle on the left and the commander seated to his rear. Specifications that apply to the PRP-3 are provided in the lists and paragraphs that follow.

#### PRP-3 Measurements

Crew, 5.

Length, 6.74 meters.

Height, 2.15 meters.

Width, 2.94 meters.

Ground clearance, 0.39 meters.

Maximum road speed, 60 km/h.

Maximum water speed, 8 km/h.

Fuel capacity, 460 liters.

Range, 500 km.

#### PRP-3 Armor

Hull  
19 mm

Turret  
23 mm

(4) Vehicle Capabilities. The PRP-3 can

- cross a 2.0-meter trench.
- mount a 0.80-meter vertical step.
- climb a 30-percent grade.
- ford amphibiously.

(5) Armament Characteristics. The PRP-3 has one layer of armament: a 7.62-mm PKT machine gun that has a practical rate of fire of 250 rds/min with a basic load of 2,000 rounds.

(6) Countries Served. The PRP-3 (Small Fred battlefield surveillance radar) is in service with the following countries.

Afghanistan	Ethiopia	Iran	Poland
Algeria	Finland	Iraq	Syria
Cuba	Germany, (East)	Libya	Soviet Union
Czechoslovakia	Hungary	Mongolia	Yugoslavia
Egypt	India	North Korea	

---

## LESSON TWO

### PRACTICE EXERCISE

**INSTRUCTIONS:** The following items will test your grasp of the material in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study that part of the lesson again before continuing. Answer the following questions. Choose the BEST answer for each question, and select the corresponding letter.

General Situation: You are an infantry officer stationed in Europe or the Middle East. As an infantry officer it is vital that you recognize and know some of the capabilities of the various THREAT light armored vehicles that Soviet, Warsaw Pact, and Middle East forces could deploy against you. Use this situation to answer the questions in this practice exercise.

1. You are in charge of a reconnaissance mission along the border of a Warsaw Pact country and observe a number of similar type vehicles (shown in [Figure 2-39](#)) deployed in self-propelled howitzer battalions. You identify the vehicles as
  - ☐ A. armored personnel carriers (APCs).
  - ☐ B. amphibious reconnaissance vehicles (ARVs).
  - ☐ C. airborne combat vehicles (ACVs).
  - ☐ D. armored command reconnaissance vehicle (ACRVs).

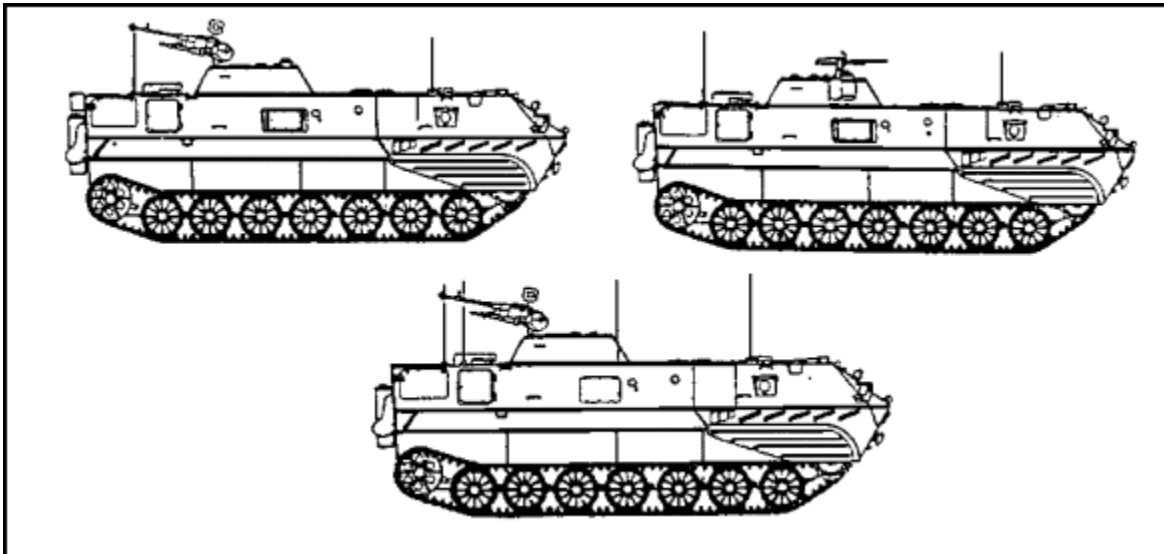


Figure 2-39.

2. Refer to [Figure 2-39](#). The vehicles position is significant because it is mainly concerned with
- A. identifying targets of opportunity.
  - B. supporting field artillery units.
  - C. front line troop support.
  - D. ferrying troops to front line positions.
3. Refer to [Figure 2-39](#). You know the vehicles fall under the designation of 1V12s and are used solely by the
- A. Polish Armed Forces.
  - B. Yugoslavian Militia.
  - C. Soviet Union.
  - D. Czechoslovakian Army.
4. You are watching a command training film of Soviet light armored vehicles and recognize the considerably smaller than average light tracked vehicle shown in [Figure 2-40](#) as a
- A. BTR-50P armored personnel carrier (APC).
  - B. FUG/OT-65A amphibious reconnaissance vehicle (ARV).
  - C. BMP infantry combat vehicle (ICV).
  - D. BMD airborne combat vehicle (ACV).

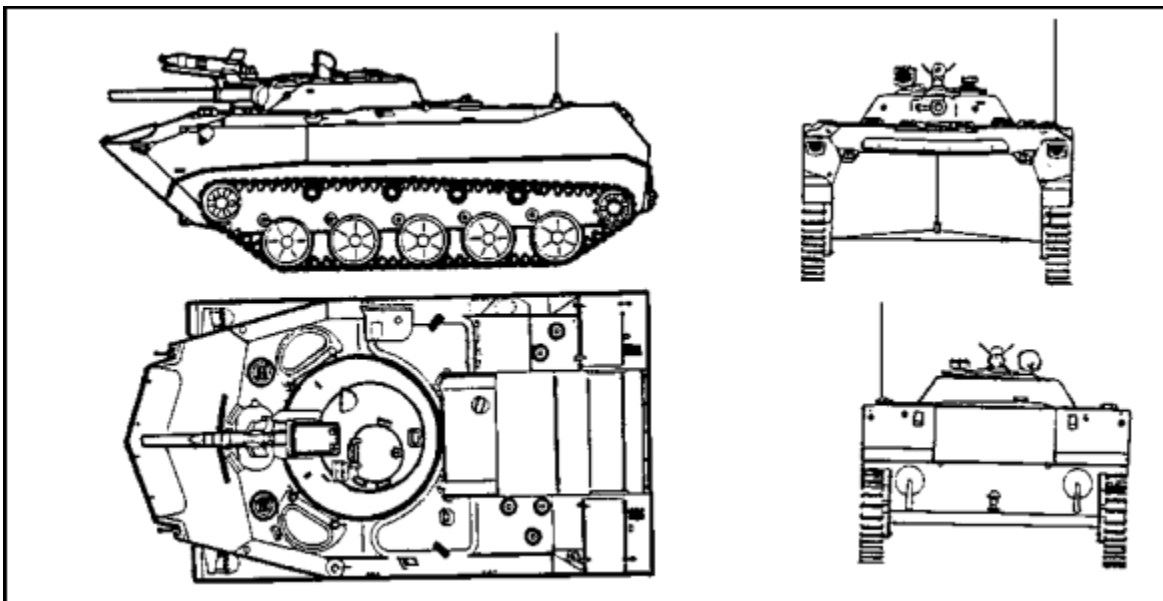


Figure 2-40.



5. Refer to [Figure 2-40](#). For amphibious operations, this vehicle is propelled through the water by
- A. a single waterjet.
  - B. a screw-type propeller.
  - C. two waterjets.
  - D. is not amphibious.
6. You observe an Iraqi light armored vehicle (shown in [Figure 2-41](#)) fitted with a 12.7-mm open-mounted machine gun, a crew of two, and twenty troops standing by to enter an open troop compartment. You identify the vehicle as a
- A. BTR-60P APC.
  - B. BTR-50P APC.
  - C. BTR-70 APC.
  - D. BTR-60PB APC.

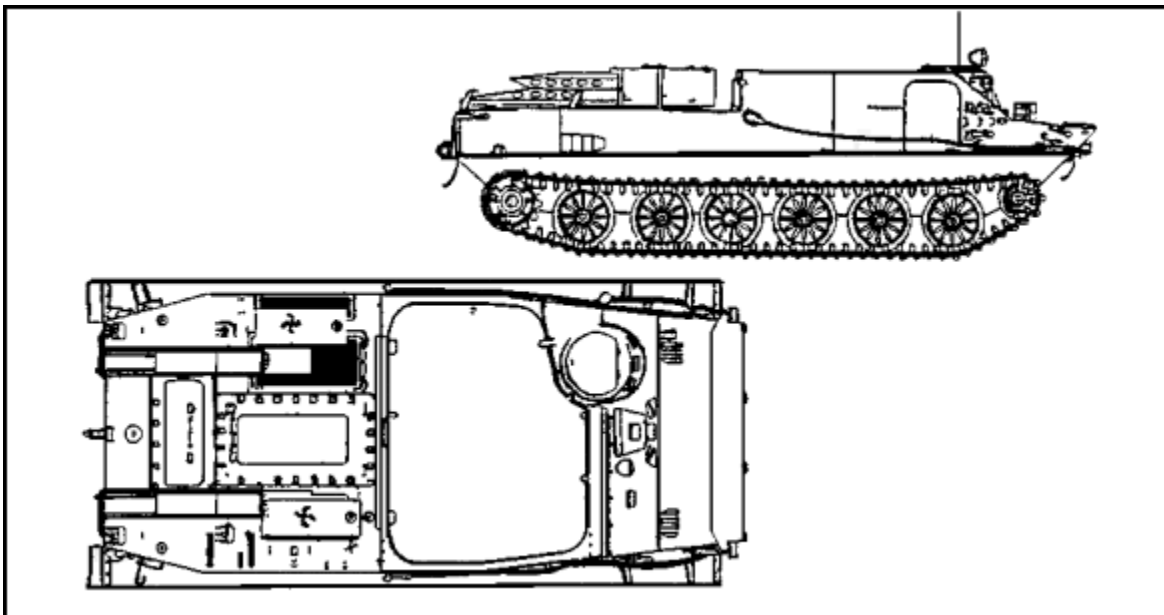


Figure 2-41.

7. The vehicle identified in [Figure 2-41](#) is amphibious and propelled through the water by
- A. its tracks.
  - B. a single waterjet.
  - C. two screw-type propellers.
  - D. two waterjets.
8. Refer to [Figure 2-42](#). You recognize the vehicle and know it is deployed as the standard APC by the
- A. Polish motor rifle units.
  - B. Soviet Naval Infantry.
  - C. Czechoslovakia motor rifle units.
  - D. Lithuanian National Guard.

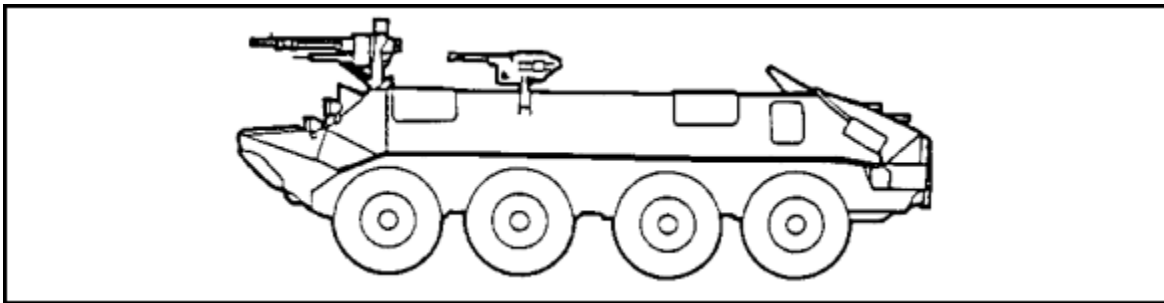


Figure 2-42.

9. You see two vehicles of the type shown in [Figure 2-42](#) offloading troops. Knowing the troop carrying capacity of the vehicles, you expect to see
- A. 8 armed personnel.
  - B. 12 armed personnel.
  - C. 24 armed personnel.
  - D. 28 armed personnel.